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THE APPRECIATION OF ORTHODONTICS

A TWOFOLD PROJECT IN EDUCATION

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ASSOCIATION with human beings involves an elemental characteristic. This is the desire for superiority. The feelings of control, of authority, are important factors if human beings are to be guided or treated or subdued. Confidence expressed by some human beings for other human beings is an admission of relative inferiority, relative in the sense that a person surrenders control to another person.

The physician, the dentist, and the orthodontist are occupied in the treatment of human beings. These human beings vary widely in social prominence, in financial security, and in intelligence. Their capacity to surrender control varies within wide limits. It does not necessarily follow that one withholds confidence as superiority characteristics increase. Nor is it true that the individual with few such characteristics readily grasps with faith at the many points of superiority outside of himself.

Indeed, there is not any exact yardstick for measurement. I have had moderate experience in attempting minor surgical work incident to dentistry in a large outpatient clinic. I judge that I have come in contact with about 7,000 different individuals. Most of these were the so-called indigent or were masquerading as such. The average of actual physical cooperation during treatment was really very high. The reason for success was the type of patient and the kind of control exercised. In other words, due to the position in which they found themselves, these patients were existing in an authoritarian type of dental society. They were able to be objective or analytical about their own subjective symptoms. Even if they could not speak my language, they were able to point to

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this or to that tooth. They saw a man in a white gown, and they associated a white gown with authority; they were willing to accept this authority to be relieved. Consequently, psychologically, the position of the dental physician in such instances is extraordinarily easy. His percentage of successes is high. Possibly his standards of treatment are correspondingly low.

While there are no two cases actually identical, surely there are similar ones. Of two such cases, why should it be that the responsibility of one may worry us not at all, and the responsibility of the other may weigh heavily upon us? Why should one of the cases turn out successfully, while the other may be a relative failure? It is partly the type of individual, possibly his ability to cooperate. It may be one of our bad days. But it may also be the capacity of our patient to appreciate the type of service we are attempting to render, the exactitude of his requirements. A difficult operation for a pauper may be simple. A simple operation for a wealthy person may be difficult. Is the crux of the situation the feeling of relative superiority which I have mentioned? Will the pauper surrender control quietly, does he do so because of inferior intelligence or because of fate? Is the wealthy person from Missouri, does he have to be shown; does he expect too much? Or, in some possibility, do we as dental physicians promise him too much? Does the presence or absence of a fee affect our prospects of eventual success? And, similarly, does this same presence or absence intensify or soften our sense of failure?

Surgery and orthodontics are considered as peculiarly weak parts in an undergraduate dental curriculum. It seems to me that they are not parallel subjects. The practice of surgery is almost entirely an art. In other words it involves a set of skills. It may involve the application of a science, but its practice is within the realm of a technical art. Orthodontics, on the other hand, seems to me to be far less of an art than a science. Having never practiced orthodontics, I can speak quite freely. It, more than surgery, involves, or should involve, an understanding of the forces of development, a conception of the speculative science of the human mind. Surgery is an art evolving from symptoms. Orthodontics is, or should be, a science developing from fundamentals. The surrender to superiority should be more simple in the case of surgery, because the symptoms are more easily felt and more easily understood. The surrender to superiority in orthodontics is, I believe, more difficult, because its aims are more speculative, more subject to outside and future influences, and more difficult to depict to the patient in terms which the patient can understand.

The very nature of your work is reflected in a special field. And when I say reflect, I mean reflect your accomplishments numerically as well as technically. Instead of following the trend toward collectivism, you seem to be clinging to the doctrine of individual accomplishment and individual effort, a doctrine which will presently be the death of dentistry, if such a trend is not stopped. You are hampered in your orthodontic activities by the capacity of human beings to appreciate what you wish to accomplish for them and by their ability to meet the mounting cost of such effort. As your field becomes more specialized, the surrender to superiority may become more and more difficult, unless the capacity of humans to understand is increased or unless the requirements of your specialty are much simplified.

Let us devote a little thought to the reasons the general dentist refers a young patient to an orthodontist.

1. A need for such service. Is it essential, desirable, or just the social thing to do?

2. Does the parent bring the subject up, or must the dentist, through months and sometimes years, gradually implant a desire for such service?

3. Are the child's teeth good enough to stand orthodontic treatment? Or, conversely, are they so bad that they may be helped only through orthodontics?

4. Is the child cooperative? This is almost another way of asking, Is the parent intelligent?

5. In cases where money is a factor, is it a question of recommending orthodontics instead of something else or orthodontics in addition to everything else?

6. Is the patient's credit record of such a nature that the general dentist feels justified in asking the orthodontist to accept another case?

These factors exist. The situation has few parallels in health service. Given a mastoid condition or an acute appendix, the necessity for quick action is obvious. It is seldom necessary to rush the young patient in an ambulance to the orthodontist. The service as such is not a necessity to existence. It may, however, be so desirable to a life of usefulness that its neglect at the proper time may amount to a barrier to success. A close cultural parallel is that of education. We are accustomed to assume that conventional public school education has several insufficiencies. We attempt, when we can afford it, to supplement these insufficiencies with special efforts toward cultural perfection which we hope will tend toward greater success and greater happiness. Such efforts are not essential to existence. They may be in special cases the stimuli producing more useful lives. They are expensive, for such efforts today are the product of an individualist society, for we have not yet become collective enough to supply the higher type of cultural and scientific education to everybody. In fact, I am sure that we should not. Now an important point about education is this: If it is to pay the dividends in life satisfaction, in happiness, and in success that we expect of it, it must be undertaken during adolescence and early maturity. With rare exceptions, orthodontic service, to fulfill its destiny, should be undertaken and completed during childhood and adolescence.

This is by way of stating that the general dentist refers only selected cases to the orthodontist. Therefore, the orthodontist sees only the selected cases. And in his turn, if he is wise, he does not accept for treatment all of the cases which the general dentist refers to him. If he is hungry enough, he may attempt to do so for a while. I am uncertain if there are any hungry orthodontists. But if from hunger, or from any other motive, the orthodontist accepts all his referred cases for treatment just because they are cases, he will presently find himself suffering from more pronounced hunger, or from more pronounced whatever it is that induced him to accept such cases. Because in my opinion, for the benefit of the patient, it is better not to start at all, than to start wrong and to end wrong. Again, your situation has few health parallels. One must operate upon an acute appendix and depend on the law of averages and the improvement in surgical skill to keep the batting average as high as possible. But you do not

have to start an orthodontic case unless you are reasonably sure of success, and it is probably better for the patient if you stick to this determination.

Socially the position of dentistry is not enviable. We have done a lot of loose talking about mouth health being essential to general health, when only one person out of four ever sees a dentist. Regardless of your splendid accomplishment as a specialty, the proportion of cases under wise treatment to those urgently needing orthodontic attention must be pitifully small. It seems to me that during the past generation we have been faced by a choice between two courses. I mean all of us connected with the health professions. One road goes the way of greater individualism, higher specialization, and proportionately higher individual expense. It ends in the ditch of the last stand of a capitalistic society. The other road seems to direct us to the citadel of social security, of which unemployment insurance and the old-age pension are far from the most important edifices. I refer to the growing demand for medical and dental care for all of the people all of the time. And it seems to me, that we have been singularly blind in the face of history, that we have educated ourselves and our public so little to an intelligent concept of this type of health fare. Our methods of training, our thoughts, our own stubborn determination not to be changed, have combined to keep us coasting along the individualist road, blind in the face of progress.

You can usually take it for granted that when a person writes a paper, he intends to be helpful. This presupposes that there is a problem. From one point of view your group has no problem. It is a tightly woven organization of exclusive specialists, designed to raise the standards of this respective specialty, and to promote the individual betterment of its members. This is a justifiable ambition. You would like to make it impossible for an unqualified, incompetent person to undertake any case of orthodontics. This is still justifiable. And you have taken what steps you could to close the door. But it will not stay closed.

There is another elemental characteristic of human beings: this may be described as grass in your neighbor's yard. A general dentist, viewing what may be your relative prosperity and having time to turn to profitable use, wishes to inform himself so that with a minimum of effort and expense he, too, may serve humanity at a substantial profit. This is understandable, if not justifiable. They did not teach him any orthodontics when he was in dental school, partly because there was not time. He cannot or will not afford the time to study in one of the postgraduate schools connected with universities. Fortunately, possibly for him, there are other outlets. Certain dentists, trained, shall we say, in orthodontics, and presumably possessing the ability to teach, are willing for a consideration to tell this dentist the fundamentals of your specialty. They may go further than this. This is an age of concentration; we like to get our knowledge quickly. What the university course undertakes to accomplish in a year, the private course will glibly promise to complete in two weeks. The result is obvious. Our general dentist learns a lot of new terms, buys some new equipment, and goes home, believing that the orthodontic world is his oyster. What follows is history. Unless he is a very unusual person, he mistakes enthusiasm and acquisitiveness for experience and judgment. If he is a good salesman, he

may make some money. If his conception of orthodontics is faulty, and there is every reason that it should be, he may achieve a measure of success and some personal satisfaction. Even his patients may feel that they have been benefited. But this last factor can be ignored, because it takes a lot of mutilation, dental and otherwise, to penetrate to the consciousness of the average citizen.

I think there is nothing on the statute book to prevent any registered dentist from attempting orthodontic treatment if he so desires, any more than there is any regulation prohibiting orthodontists from attempting oral surgery. But you would probably do the surgery better as orthodontists, than the general dentist would do the orthodontics, if he was a general dentist without special training. What is happening is obvious enough. In comparison with the way you would like to see it, the level of orthodontic treatment is inadequate. Just as the best that I can do as a general dentist seldom satisfies me. I do not want to be satisfied. When I become satisfied, it is time to die. You have, however, as a group set up certain standards. So long as everybody attempting orthodontics is attempting to live up to them, everything is all right. But the public, generally speaking, does not know anything about your standards, and to the public, anybody, I mean any registered dentist, who wished to so designate himself, can be an orthodontist. Your standards are being threatened by people outside of your control, and your earned reputation for integrity is being damaged by inadequate training and by incompetent administration. Is this not so?

It is probably very foolish of me to think that I can offer helpful suggestions. But your problem isn't any different from mine as a general dentist. Except that there are more general dentists and that means that there are more of them who have not taken advantage of their opportunities. You are organized. You attempt, with some success, to set up a centralized authority which states the standards of your specialty. I believe that people who know more than other people should be given the opportunity to express themselves. But centralization can be too absolute, and an organization can be too concentrated. I believe that you have too many generals and too few noncommissioned officers and privates. There is too big a gap between ambition and accomplishment. And, I believe that during a necessary interim, where university postgraduate instruction is either not fully developed or too expensive, the proprietary school of instruction might be utilized as a steppingstone, accepted by you as the lesser of two evils instead of creating dissension and enmity by opposing something which at present you are not in a position to prohibit.

And if it comes to education of the dental profession, and I think it does, there is nothing to prevent your embarking upon a constructive program of statute modification, so that the public may be protected against incompetent or ignorant practitioners, and that the level of your calling may be correspondingly raised.

It is obvious, however, that to educate the dentists and the dental profession is not sufficient. We all know this; we have always known it. The reason we have done so little about it is that everyone has a different idea, and we have been hampered by a combination of prejudices. I think that going to the public with educational material is one thing which the orthodontic specialty has not

yet attempted. You may consider it as a purely educational problem, if you prefer. You may, which I consider more logical, approach the public as a potential market for honest health merchandise, and openly solicit the use of this merchandise.

There was a time during the golden age of the 1920's when dentistry tried to kill itself through overspecialization. The word specialist has an ugly sound. For specialization in the cell sense of the term means death. One of the problems we are facing socially today as the result of a civilized world is the extreme probability of the death of the individual in favor of a collectivist type of society. I do not like the term specialist; indeed, none of us like it, for in a sense we are all specialists, and as such are relatively ignorant human beings.

You have a problem when it comes to orthodontics, for orthodontics is one of the two specialties which I believe that dentistry and the public can afford to support. You have probably experienced hungry dentists as far as orthodontic service was concerned in common with our brothers in oral surgery. And you cannot say that the motivation for the general dentist's acceptance of such work was altruistic. You do not care what the general dentist does in orthodontics, as long as he does his work well. The more good orthodontics that is done, the better it is for everybody. But the public is not very clever at discriminating between good orthodontics and bad orthodontics. Because when it is bad, sometimes the public has not sense enough to know it; and when it is good, sometimes the public has not education sufficient to appreciate the limitations of the human dentition. Probably better orthodontics would be accomplished if you were able to enforce a regulation forbidding anyone to attempt it who did not possess the authorization of your body. It might be better orthodontics, just as the Rolls Royce was probably a better motor car. But there were never very many Rolls Royces, and under this scheme there would not be much orthodontics.

On the whole, I believe that the capacity of the public to be educated to an appreciation of real orthodontic service is distinctly limited. At any rate, it is not your function as specialists to so educate the public. Not unless you intend to establish a separate profession and to make your bid for public patronage as an independent entity. This does not mean that the public should not be educated. Far from it! But the education of the public should be undertaken upon simple, visible, repetitious lines of a nature intended to stimulate a general interest in dental health, rather than a particular desire for a specific bit of specialized dental merchandise.

Please let me illustrate my meaning. I am not descending culturally when I select the publicity employed by tooth paste and toothbrush manufacturers. These manufacturers are interested primarily in their products. But they recognize the tremendous influence of favorable prejudice, as well as the large hindrances resulting from antagonism and anger. They attempt to link their product with the dental office, realizing that the dentist is a vain individual and will probably react favorably. I believe your educational problem as regards orthodontics is a dual one. It is one which cannot be separated from the general aims of dentists and dentistry. Dentistry and dentists must educate the public to an appreciation of dental service, to a desire to accept continuous dental care,

and to pay for it. The orthodontic specialty must then and now educate the dentist either to undertake orthodontics himself, or when the door opens on a patient who has been stimulated to an interest in dental care, and who needs orthodontic service, to undertake the proper ethical reference and place that case in competent hands where it belongs. You cannot do it alone. General dentistry cannot do it alone. The public will not come to it by itself. It will take a combination of all three.

There is probably, although we do not often admit it, the makings of a clash between the general practitioner and the specialist. This involves a series of simple definitions: The specialist is one who through continued and concentrated application may allow it to be known that he is concentrating within a more narrow circle than that encompassed by the general field, and who, within the scope of his special activities, may be regarded as an authority. The general practitioner, while possibly devoting study to this same special field, does accept other work and does not set himself apart from other practitioners, as presuming to special training and special knowledge. It would be unfair to state that all orthodontic specialists were competent. It would be equally unfair to condemn the general practitioner of dentistry who accepts orthodontic cases as incompetent simply because he was a general practitioner.

Why should anyone become a specialist, and what are the factors which tend to make a person a successful specialist? These are in two classes, predictable and unpredictable. The predictable factors are as follows:

1. An aptitude and love for the given specialty.
2. A willingness to make sacrifices.
3. A pardonable acquisitiveness which desires the larger rewards in the special field.
4. A distaste for some of the other details, likely to be relinquished once the specialty is decided upon.

The unpredictable factors are as follows:

1. This man's relative ability to create useful contacts, and to secure reference material.
2. The comparative capacity of other men in this special field.
3. The specialist's ability to keep his public satisfied, and at the same time to satisfy himself.
4. The same person's ability to dispense and to acquire special knowledge and make professional friends thereby, not enemies.

Probably not all choices of orthodontics as a specialty have been fortunate. Indeed, there must be many orthodontists who wish that they were back in general practice. But regardless of the proportion of misfits, all specialists must be conscious of the desire for many times the number of competent orthodontists. A point which I should emphasize is this, that regardless of how you increase your numbers, those numbers will still be insufficient to care for the children of this country who require and who will require your competent aid. You are not going to increase your specialty overnight. Neither can you create a new profession. You are forced to fall back on the general dentist.

If the general dentist is really an important factor, let us examine a reason for his existence. I mean the reason for his existence, as related to the specialty of orthodontics.

Why should a competent general dentist remain a competent general dentist when the opportunities for human service may be greater in orthodontics, where the appreciation of human beings may be greater, and where the financial remuneration may be larger?

Of course you hear a lot of conversation such as this. So and so would never make an orthodontist; he does not like children. Probably the person referred to never should have been a dentist at all, let alone become an orthodontist. I do not think that your ability to handle children is so remarkable, because in the main you do it under the most pleasant surroundings known to dentistry, and your operative efforts are fraught with less prejudice, traditional fear, and less physical discomfort. If all that you are able to do is to get along with children nicely, I doubt if you would earn your place in the sun. But your psychologic problem really is not the child. Your problem is the child's parents. Given a suitable appreciation by the parent for the child's problem, given some means of stimulating and maintaining a continuous interest in the progress of any service which you attempt, then the combination of your ability to live pleasantly with children and in harmony with the parents becomes a very wonderful characteristic. I doubt, however, if your situation differs markedly from that of the competent general practitioner. Why, then, if some of these competent general practitioners possess potentially the same characteristics, do not they become orthodontists?

There are a few answers to this question, some of them satisfactory. There is a joy, and I know what I am talking about, because I am experiencing it, in a lifetime of service for human beings through their lifetime. There is a continuity of interest in one's association with the same human beings, while they are changing, while I am changing myself. The period in a human lifetime of your useful activity seems too short for my taste. One of the reasons that it is short, and in my opinion one of the reasons why conventionally your influence upon the dental life of the public ends as early as it does, is because the subject of your ministrations must usually be under the control of an older person, both for command to live and for support of life. Your greatest effectiveness comes from a parent-controlled adolescent during that early period of maturity, where liberty has scarcely begun to take wings and where an appreciation for human problems has not yet been born. There must be some reason other than what you call physiologic growth, for the cessation of orthodontic activities when the family purse strings begin to tighten. You are bound to consider yourselves and your success and your results. But one of the reasons that some general practitioners remain general practitioners is because of a desire to see this period of transition through, to watch the dawning of appreciation, to study the tempering of experience upon character, and to stand by as teeth wear out, along with the body.

When I commenced to gather material for this paper, I asked a few questions of my orthodontist friends. And I discovered that the problems of the specialist are similar to those of the general practitioner. I almost said identical.

For example, may I quote one question? "What should be the public's attitude regarding the professional specialty?" Paraphrasing the question to my own problem, What should be the public's attitude regarding the general dentist? That such a question should be asked at all is convincing evidence that the public's attitude concerning the professional specialty or concerning the general dentist is not the expected one. Were you, or were I completely content with our public's receptivity to the stimuli which we can supply, we might be asking other questions and considering other problems. The prejudices of the public against the general dentist are too well known to require description here. But what, if you please, does the public say about the orthodontist? You can treasure the favorable remarks made and take them home with you to increase your appetite for dinner, because they are of no constructive benefit. So what therefore, unfavorably does the public speak of you? Let us think in the terms which the public uses, as follows:

1. Too expensive.
2. Too long.
3. Too much trouble.
4. Too indefinite. No one understands what you are driving at.
5. Too many cases have relapsed, no permanent good has been done, for such an undertaking to be attempted.

This list could be prolonged indefinitely. You know the items better than I do. I know the things they say about general dentistry better than you do; and they say worse things and more of them are true. But if enough people think the same way about something at the same time, then that something is ordinarily accepted as truth. You cannot get away from it.

When you speak of supplying orthodontic service to the public, you are creating and you must maintain a market for such service. And you hope you can stimulate and maintain a demand for such service. There are, as I have said before, no exact parallels. There are certain comparable activities. A generation ago, electric refrigeration and the radio were not commonly accepted commodities. The public did not just buy them. The public was educated, slowly, painstakingly, patiently, to an appreciation of the value of these new commodities, and a desire for purchase was placed in their hearts, through just as technical and involved a process as the original procedure of design and manufacture. This again is in the field of public relations. Now since these two industries, just referred to, were dealing in inanimate commodities, and since technologic skills are constantly being improved, the trend has been toward mass production, quantity first, quality, if possible consistent with quantity, and with constantly lowering costs.

Now it is not frequently that one can find an example of largely increased production at a largely increased cost. This parallel I find true in education. It takes more work, more time, and more money to produce a culturally or scientifically trained individual today than ever before. And yet the number of young men and women undertaking this training at someone's expense is increasing every year. In other words, the commodity, an educational product, is being turned out in masses, by quantities, and still, we hope, with a quality stamp.

I believe that the principles underlying the two examples, that of quantity production with lowering costs, and quantity production with rising costs, are brought about by the same devices, by the same means, through the employment of similar fundamentals. In order to appreciate electric refrigeration or a radio at any price, John Public must be trained or educated to such appreciation. It is for no philanthropic purpose that quantity has increased and costs have been lowered. If the people who manufacture such commodities could make more money with fewer units at a higher cost, they would do so, and the public could go hang itself.

The reputed value of cultural and scientific education is something which is impressed upon the public not by accident. That the methods employed are more devious, sometimes more ethical if you will, and certainly much more difficult to trace to their source is a tribute to, and not a criticism of, those in authority in our educational institutions. The response of the public to concrete commodities such as refrigerators and radios was estimated in advance. The public's attitude concerning these commodities is, I believe, exactly what the producers wished it to be. The response of the public to constructive propaganda favoring higher education is to me a pointed indication that the stimuli leading to the responses have been carefully calculated.

Therefore, repeating the original question, What should be the public's attitude regarding the professional specialty? The refrigerator and the radio are honest products. Education is founded upon honest foundations. The ambitions of an organization of orthodontists are honest and legitimate ones. The aims of general dentists are understandable, logical, and for the mutual benefit of dentistry and the public. That is good; the first step has been made. You have the product. It is as good today as you can make it. When better orthodontics is made, orthodontists will make it. But what you do not have, what general dentistry does not have, in addition to the product, is a program. What should be the public's attitude? If other factors are right, and you believe that they are, the public's attitude concerning the professional specialty should be precisely what you wish it to be. How else can you explain the education of a child? If the child's response is not the expected one, then it is the fault of the parent.

A helpful thing to remember in calculating the public's response is this: If the project in education is one of some magnitude, such as orthodontic service, then you must remember that you and we are in competition with other factors which are crying for the portions of time, strength, and money which we seek to appropriate for the benefit of ourselves and our patients. Now in order to overcome the feeling on the part of your and my public that dental and orthodontic services are too expensive, we must make our arguments relative ones. Too expensive? More expensive than what? Less worth while than something else or more worth while than other health services? When and where indicated? You are safe in ignoring those instances where orthodontic or dental service is accepted at its best as a matter of routine and at no sacrifice. You and I will get those cases anyway, and their numbers will not increase.

But in the majority of instances, in those cases where the most human good can be accomplished, in those cases where over a lifetime of service the greatest permanent profit lies, the acceptance of your services will be selective. It will be instead of something else, rather than in addition to everything else.

This hypothesis implies a stern responsibility of education. As I have indicated, I believe that education should be twofold. I am convinced that you should join with the forces of general dentistry in telling an honest, simple, straightforward story of dental health to your public. I believe that the information so presented should not be technical, should be so simple as to seem almost childish to you. I believe that the efforts should be to direct patients up the stairs and through the doors into dental offices, by whatever legitimate and ethical means is opened to our combined specialties. Then, once the patient is there, once the door of the dental office is closed shutting out the outside world and leaving the patient with the dentist, the dentist who is alive to his responsibility must from then on accept the burden of education. He must either accept orthodontic service as a part of his professional curriculum or must have the good sense and the guiding wisdom to see that that patient requiring superior and special knowledge is referred to the proper hands.

Personally, I feel that better orthodontics will be done if it remains in the hands of specialists. I feel that such orthodontics will be too limited numerically to be socially of importance. Also I feel that for general dentists to do a lot of orthodontics fairly well is better for the human race than for a few specialists to finish a few cases to a high degree of superlative perfection.

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DISCUSSION

Mr. Dwight Anderson.—I want to say, first, how much I have enjoyed this scholarly paper of Dr. Cooke's. It might almost seem to be a résumé of conversations and conferences among the group that has worked in this Society for the purpose of formulating a public relations policy. I do not think anything has been omitted by Dr. Cooke that has not at one time or other come up for serious consideration, and some of the things that he presents so trenchantly doubtless go to the very roots of sociologic and economic problems upon which, of course, I cannot momentarily speak.

I do want to say that these matters often become, as the clash of individual temperament and belief occurs, rather difficult to solve. I remember a phrase used by a certain man recently, who said that a public relations man must have "the soul of a butterfly and the hide of a rhinoceros." I think that as various groups, thinking differently, each sure that he is right, approach a solution to these problems, we are singularly fortunate when we have such an objective attitude as that shown by the previous speaker. Here certainly are brought up considerations worthy of our deepest study.

What is the capacity of the human being to understand, and how is that capacity to be increased? What can we do genuinely to place before the dentist and the pediatrician what we consider to be sound principles of orthodontics? Then, if the dentist can equip himself, as Dr. Cooke has so well said, to take care of part of this problem, this is wholly unobjectionable.

I would like to hear someone discuss the speaker's reference to the science of orthodontics, because perhaps I am mistaken in my view as I have obtained it here and there through association with the members of this Society. I had been led to believe that the practice of orthodontics was primarily an art; that it was an art extremely slow in its development over a course of years to such proficiency as will save the patient from bad

results. If it be primarily an art, and therefore personalized in the artist, we are getting into a realm which makes it less possible to increase the distribution of its skills. Are we ever able to bring adequate (by that I mean the best) medical, dental, or orthodontic care to all the people? As these skills advance they are going to advance farther in some centers than in others, and, while the best medical care is of a certain standard, the medical care that is given widest distribution will always be below that grade. This is true of orthodontics, too. I do not mean that we should stand in the way of any effort to make orthodontics available to more people, but this must not be accomplished through the relaxation of standards which are at best quite difficult to establish and maintain. But just how are we going to extend orthodontic care wisely, except through the persuasion of the dentist as to just how he and the orthodontist can fit themselves into the entire scheme of health services? I mean giving the dentist a better understanding of the skill of the orthodontist and the definite limitation of his own capacities in the orthodontic field.

I think we have all enjoyed Dr. Cooke's talk, and I hope to have the opportunity to read it in full and give it further study.

Dr. Leuman M. Waugh.—I had no thought of attempting to comment on Dr. Cooke's paper while he was reading it and, therefore, made no notes. I will say that there is not one major point that Dr. Cooke brought out with which I do not heartily agree. I think it is the most analytic and the most logical presentation upon this subject that I have heard. I wish Dr. Cooke were less engrossed in general practice and were a little more in our persuasion with reference to the superiority of orthodontics as a glorious service to humanity and would join the ranks of the orthodontist. I know he would contribute a great deal to the effort we are making for the education of the dentist and of the physician and of the public.

He has given us his views, may I say, from the outside of the specialty looking in. He has brought up a number of problems that for him I may endeavor to answer very briefly because we want the general practitioner to know. We agree that orthodontics has been entirely too expensive for the rank and file of the public. It has been too expensive not because the orthodontist is particularly avaricious but because from the very nature of the work it takes a long time. I want him to know—and I believe those in the room who have practiced real, serious orthodontics, can bear me out in this—that orthodontists who can finish twenty-five cases per year are busy, hard working orthodontists. We may start a lot more, but all may not follow through to completion. We cannot have great numbers of patients under our care, because we see them regularly every few weeks for extended periods. Oftentimes when there are relapses, this question of the purse strings being rather tightened and father and mother having spent all they possibly can for a result, I know there are a great many of us who just take those cases and start over again without any hope of additional fee. Those things I do not think the general practitioner in dentistry quite understands.

Mr. Anderson, I liked Dr. Cooke's analytical consideration of the art and the science of orthodontics. I agree with Dr. Cooke. I think in orthodontics, if we are to be successful, we must know and apply more of fundamental science to our work than in any branch of dentistry. I have said often, being the son of a dentist and having practiced general dentistry in part for twelve years, that I know of no calling in life in which there is so exacting a demand upon the physical powers and upon the skill of the individual as there is upon the general practitioner in dentistry. I think that is what Dr. Cooke meant when he said that the art of orthodontics, the mechanical exactions are less difficult than those of general dentistry, and unless we, as orthodontists, know more of the fundamental sciences pertaining particularly to the physiology of growth, to the biologic changes that occur, to the sequential periods in which certain physical changes in development should occur we shall not progress. If that is what Dr. Cooke meant, then I still feel that it was the nicest analysis and explanation of the subject that I have heard.

I want to remind Dr. Cooke and ourselves of just one thing that gives me the greatest satisfaction. In 1921 I took up the work of organizing a post graduate school for orthodontics in a university. No such course was then in existence. Eighteen years ago there was much discussion in the meetings of the American Association of Dental Schools (now called),

in which the majority of the teachers, especially professors of prosthesis, expressed the thought that orthodontics was a part of prosthesis, and that it was a matter simply of teaching appliance technique, and that after the students in the undergraduate course had been taught to treat two or three cases in the school clinic there was no reason why they could not go out and practice orthodontics. Just about three or four of us stood out against this view. I remember Dr. Frederick Noyes was one who stood out stalwartly and said that orthodontics required training beyond that possible in the time that was available in the undergraduate course. We brought out the fact that a vote of our students in the undergraduate classes had shown that those who wanted training in orthodontics had never exceeded 14 per cent and sometimes was as low as 4 per cent; therefore, I argued, why force the 86 to 96 per cent to study orthodontics when they did not care about it and never would want to practice it? Why take their time from those subjects which were strictly within the realm of general practice in dentistry and compel them to do something they did not want anyway and never would use when they did get out? Today we have about one-third of the university dental schools offering either post graduate or graduate courses in orthodontics. There are thirteen of the thirty-nine Class A university dental schools announcing such courses, so adequate instruction in orthodontics is growing. Orthodontics has been accepted as a function of the university, and so, Dr. Cooke, there is no excuse in my opinion for a general practitioner hurrying to take a one- to four-month course, usually at a tremendously high fee, when it is absolutely impossible to get a safe training in that time. The men giving these short courses locally get much more money for their short courses than a university does for a twelve months' whole time course or for a twenty-four months' course of half time. It costs more to get the short course, and the men get very little more than just a training of bench technique. Therefore, I believe that any conscientious general practitioner who wants to qualify himself for orthodontic training can arrange on a half-time basis to carry on his practice and support himself and get a thorough training. No one objects to the general practitioner doing orthodontics; provided he will properly prepare himself, study his cases, lay out his treatment, work intelligently, and get results for his patients. We all know that many children cannot have the benefit of orthodontics because there are not enough orthodontists to give it. The orthodontic problem may be considered in four divisions: One is prevention in orthodontics or better stated preventive malocclusion; two, is correction in orthodontics; three, is post-treatment observation; and four, is tooth movement for adults.

Prevention in orthodontics is what we are teaching undergraduate students. We teach them those things that essentially we believe belong to the general practitioner, and we teach them with confidence that if they will carry through those factors in their general practices they will prevent from 35 to 50 per cent of the need for complicated corrective orthodontics. We teach that corrective orthodontics is the duty of the specialist, one who has had training after graduation from the undergraduate school, and we believe it should preferably be the duty of the exclusive specialist whenever he can so practice. Postoperative treatment is a divided function between the orthodontist and the general practitioner. For a short period immediately after the active treatment is finished the orthodontist would perhaps better look after the case, gradually merging into the care of the general practitioner who, seeing anything that he feels may be in the nature of a relapse, will refer them to the man who did the treatment, if possible. Tooth positioning for adults usually is done so that one may get mechanical advantage of the teeth remaining and thus restorations may be more esthetically and more efficiently made. I think the general practitioner can do that almost better than the orthodontist, but those who prefer not to may send such a patient to the orthodontist. However, there should be a thorough understanding as to the end result desired. So you see, Dr. Cooke, we believe that it is a divided problem. We want the general practitioner to do all of it that he will do thoroughly, but we do not want him to do any of it that he cannot do thoroughly—as thoroughly as you or I would like to see it done for our own child.

Dr. Frederic T. Murlless, Jr.—Both Dr. Waugh and Mr. Anderson have already expressed opinions with which I agree and have said some things that I might now refer to if they had not already been discussed. Even to enlarge upon them would be repetition.

Dr. Cooke in his fine and interesting paper has given us some delightfully epigrammatic phrases, and I shall thoroughly enjoy reading it when it is published. I hope to see it soon, after which it is possible that there may be some further exceptions that I might wish to add to those that Dr. Waugh has mentioned.

President Rogers.—If any other member wishes to discuss Dr. Cooke's paper, his time will be limited to two minutes.

Dr. Lawrence W. Baker.—I hope that in the two minutes to which our president has limited us to discuss this able and forceful presentation by Dr. Cooke, I can at least have time to thank him. It is, indeed, remarkable that a non-orthodontist should show so much interest in our specialty as to drop his own work and make the long journey to New York to present this message, to say nothing of the many hours which he must have spent in preparing such a masterly paper. Thank you, Dr. Cooke.

Among other things, Dr. Cooke pointed out to us the crux of the future of orthodontics; it is education. The orthodontist of the future is going to be, from the scientific standpoint at least, a more broadly educated man than that of today. He is going to receive this orthodontic training not in the short postgraduate courses extending over only a month or so, but in graduate courses to be given in the dental schools of our universities. These courses are going to extend throughout the entire academic year. This means at least a year of hard intensive study in orthodontics and its related subjects. We already have such a course in several of our university schools, and they are all doing good work. The short postgraduate course has done its work and is fast becoming a thing of the past. I am delighted to learn from Dr. Waugh's remarks that he has been thinking along similar lines.

Our program for today reflects the trend of time. Note that of the six papers to be presented, three are to be given by biologic authorities. One paper is on the function and its influence on growing structures, another on an adequate calcium and phosphorus dietary regime, and still another on the psychology of nervous habits. All these subjects are closely associated with orthodontics, as it is now practiced. It is impossible to give our students such fundamental teaching in these biologic subjects as well as, of course, all the exacting technique work in any short postgraduate course. Orthodontic education must not only prepare the practitioner, but it also must train the research worker. The hope of the future of orthodontics lies in the graduate course in our university dental schools.

President Rogers.—There will be time for one other short discussion. There is no response, so I will ask Dr. Cooke if he will kindly close the discussion for us.

Dr. Cooke.—I suppose, gentlemen, that basically I am not a bit disturbed about the scientific future of general dentistry any more than, as an outsider not practicing orthodontics, I have any feeling of lack of confidence in the attainments of a group of orthodontists. I think I intended my talk to have a fundamental basis, and that fundamental basis was a very real anxiety in regard to the appreciation of the public for the acceptance of any extra-curricular activity that requires they spend any money. That is descending a little far culturally. It is an unpopular subject. But, having a commodity which we expect the publicity to buy, and interesting the public in the commodity, whether it is health or radios or refrigerators, is almost as important to me as educating dentists and training orthodontists.

It is probably quite true, Dr. Waugh, that no one yet has met a really wealthy general dentist and probably never a really wealthy orthodontist. Probably no one will ever meet them. I hope they do not because I think there are cultural demands of unselfishness and of service that go with the health professions that would make such an attainment impossible. But that does not mean that we cannot make an honest bid for public acceptance of health merchandise, that we cannot guarantee, if possible, to every qualified person the means and the opportunity of making a living.

If I could take a couple of minutes more I would like to tell you of an experience I had last winter. I had the dubious distinction of attempting to organize a thousand Boston dentists to donate to our community fund. I had ninety or one hundred dentists who very unselfishly worked with me or for me, as you wish. Also, I had a very unsatisfied conception as

to the economic condition of the general dentists in the neighborhood of Boston, so I kept out fifty names to call on myself. I called on those fifty men at a time of the day when you ordinarily would expect them to be busy. I found forty-eight out of the fifty dentists in their offices and one patient in the forty-eight offices. It is probably true that some of those boys never should have been dentists at all. You may say that the presence of a dental patient in a dental office is not proof that the dentist is successful; but the presence of no patients in a dental office is proof that the dentist is not operating for profit invisible.

One other thing—I would like to have an opportunity to discuss this subject with Mr. Anderson. The realization that the public has to be considered and that the professions also have to be considered is not a new thing. Our medical brothers are making certain attempts at capturing the public attention. We have a series of broadcasts in Massachusetts at the moment which are entitled, I believe, "A Green Light Series to Health." After the first broadcast, many of the Boston papers carried editorial comment on the talk, and approximately 800,000 people listened in on that first broadcast. Those people who listened received free advice over the radio from a specialist which would cost them a pretty penny if those same people went to that specialist's office.

I am very much in favor of service. I am very much in favor of emphasizing this opportunity for service, but, like Dr. Waugh, I have a background in dentistry that I am attempting to live up to. I think it is an unbroken line from 1815, and I am getting interested, as I go into the last part of my middle age, in seeing to it that some of us attempt to help our less fortunate brothers by setting up sensible rules of economics so that when the story is all written, the dentist will prosper and the public will be benefited.

THE PSYCHOLOGY OF NERVOUS HABITS

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PSYCHOLOGY is the baby among the sciences. In it we have done a great deal, but there is much yet to be done. On this question of nervous habits, there has been comparatively little done about the analyzing, classifying, and building up of a vocabulary and terminology that are worth something, that are scientific.

"Nervous" means too much nerve. A "habit" is something that you are supposed to have learned; something that someone has taught you or that environment has taught you; something that can be unlearned. Thus we find that our practice in regard to nervous habits does not fit in at all. We do not know where a nervous habit begins and where an emotional state starts in. We do not know where a tie begins or ends—a spasm, a phobia, a fear, a mania. We have a very loose terminology. We have not explored or charted the field, but there is a great deal that can be learned. We can go into the primer stage of these so-called nervous habits. I am going to limit myself so far as I can, although not strictly, to the field of nervous habits. I shall have to define the field also by telling you where we cannot go.

First of all, you have to realize there are certain habits, so-called nervous habits (I prefer to abandon the term "nervous" and use the term "emotional" habits) of which the individual is conscious. For instance, in thumb-sucking the baby is conscious that he is sucking his thumb. You see it, and you tell him about it. You think you know what causes it, and you want to know how to stop it. You put some bad tasting things on the baby's thumb, or put a cage on it, or strap it. You put a glove on it or wrap it up, but none of these remedies will do the trick, because it is all poor therapy. It is treating the symptom and not the cause.

We have other habits, such as picking the nose, nail-biting, stammering, sniffing, and banging the head, all classed as nervous habits. We know them as symptoms of an emotional state, and generally that emotional state is based upon a condition of anxiety, insecurity, inferiority, and tension.

We are concerned chiefly with the nervous habits of children. I wish that I could get you to adopt one attitude toward these children; get a "sense of otherness." Get the point of view of what would have caused you to do that particular thing, if you were the child. The child is seeking satisfactions. He wants attention.

In the case of stammering and stuttering, for instance, I analyzed and classified 300 cases of stammering and stuttering up at City College. The remarkable thing that came out of this study was that they all began at or about the age of six years. Why should that be? These 300 cases were all boys. Incidentally, there are very many more boys that stammer and stutter than there are girls because the relationship of the boy to his mother is altogether different

from the relationship of the girl to her mother. As I said, they started at or about the age of six. At that time the boy begins to be aware of himself. A child before the age of 5 or 6 years is unconscious of himself. I wonder if you can get that point of view. He is conscious only of you; how big you are; how loud your voice is. Then he becomes aware and conscious of himself. He knows that he has hands, and it is a rather interesting little performance when he becomes conscious for the first time that he has a back to his head. Formerly he was consciously aware only of his face as he saw it in the mirror.

Another thing that comes out of these nervous or emotional habits, based on anxiety as exhibited in stammering and stuttering, is the fact that many boys are born left-handed and their parents do not know it. We live in a right-handed world. Boys will begin to masturbate earlier; they will bite their fingernails, pick their noses, suck their thumbs and stammer—all because they were born left-handed, and no one knew it. It seems rather strange that that condition could exist, but it does exist. There are degrees of left-handedness. If you are born to be left-handed and are forced to be right-handed, then you immediately go into a condition of anxiety and nervousness because you are not using the hand that you want to use.

We have many devices whereby we can tell whether people are naturally left-handed or not. Perhaps you would like to try one. Just clasp your hands with the fingers interlocking. Did you naturally put your right thumb on top or did you naturally put your left on top? Those of you who put your left thumb on top were born at least partly left-handed. If you applaud by holding the right hand out and hitting it with the left, you are left-handed. If, on the contrary you applaud by striking the left hand with your right, you are right-handed. If you applaud by striking the hands together you are ambidextrous.

What is the cure for stammering and stuttering? It is to analyze, to re-educate, and to readjust the individual. You cure causes of stammering and stuttering chiefly by letting the children go left-handed again if they want to.

Let us take the question that would probably appeal to you more than anything else, that of thumb-sucking. We psychologists watch these things. You would be surprised to know of the cases that I send to my own dentist because of personality defects that are caused by bad teeth, broken teeth, irregular teeth, and misplaced teeth. I could give you some very dramatic illustrations along with the dentist.

The thumb-sucking child, as you know much better than I, pulls the teeth out from him. What can we do about thumb-sucking? It is a rather difficult problem. We used to claim, and always had for many years, that all of these nervous habits, ties, phobias, manias, and lalias are incurable. They are difficult to cure, but we can cure more today than we had ever thought possible.

Thumb-sucking is caused primarily by two conditions, both extreme: the child was weaned too early or he was weaned at the wrong time. It is what we call the weaning trauma, the weaning wound. It is the wound, the bad condition caused by the fact that the child, let us say, was nursed for about two months and then was stopped suddenly, or was nursed for about ten or twelve

months and then was stopped. If the child had been nursed for two or three weeks and then was stopped, there would be no thumb-sucking. You must project yourself, get yourself into this state of "otherness." You must project yourself into the mind, the personality, and the state of consciousness of that child to find out what was the cause back of his trouble. Never try to treat symptoms. Analyze the symptoms down to causes; then adjust the cause to effect the cure.

We have what you would call nervous habits that are unconscious. The person is unconscious of the habit. He may be doing things with the head or shoulders. These are ties—eye ties, mouth ties, or ties within the nasal cavities.

Is it a nervous habit for a child to have nightmares regularly? We say that it is. The mind never ceases. We look upon sleep quite differently from the way you do. Your mind never sleeps. A nightmare is always caused by anxieties in the child. We tell the parents that, to prevent nightmares, they should never make love in front of their young children and should not quarrel in front of them. By doing so, they are brought to a state of nervous anxiety that carries over into a nightmare in their sleep.

These symptoms are always a retreat to infantilism. The child wants to return to being an infant. He feels inferior, inadequate. I wish I could make you feel the way that a little child feels toward the world. You are big to the child, a veritable giant. How strong you are! The child also feels the same way toward brothers and sisters. Infantilism is the basis of many of these so-called nervous habits. The child wants to go back to the state of infancy. In fact, one of our very great, but not very well-known, psychologists, Dr. Otto Rank, who was the secretary to Freud for twenty years, maintains we are all trying to get back into the state of blessedness that we found in the mother's womb. I believe there is a great deal to his point of view.

The child is trying to get attention. It is very important to the child's ego that he receives attention, and he wants attention from just one person, his mother. If I had my way, we would never have any "only" children. I would fix it so that, when the mother became impregnated for one child, she would have that child and then automatically two years later, without any further assistance on the part of the father, there would be another one born.

You will find a good many nervous habits, these various symptoms, are caused by the mother's betraying the child. It is a very serious matter when a child is an only child for six, seven, or eight years, and the mother betrays him by having another baby. That is particularly so if the child is a boy. Keep that in mind.

He has been the center of his mother's interest and attention for many years, and suddenly he is sent to visit his grandmother. Well, he doesn't want to visit his grandmother. He wants to get back to his mother. Finally when he is permitted to go, he dashes into the house, all full of anxiety for his mother. Where is Mother? "Sh-sh-sh. Mother is sick. She is upstairs. We have a wonderful surprise for you." He goes up to see his mother, and he wants to jump up on the bed and hug her. "Sh-sh-sh. Be careful." He is stopped, and his mother says, "Look what Mother has for you." Here is the interloper.

The child is dethroned, and immediately nervous habits begin, emotional maladjustments of one kind or another. The child becomes jealous, and he wants revenge.

You will find some children begin to bang their heads against things, particularly when they are in bed. They want attention. The child will be constantly tapping or kicking something. Why? He wants to have revenge on his mother. He wants to make his mother uncomfortable because she has not been nice to him. So he does all of these little things that he soon discovers cause her annoyance. This will draw her attention to him, and will be a revenge against her. This is purely an emotional state and has nothing whatsoever to do with "nerves."

A good many of these things are also caused by sexual maladjustment. Sometimes the sexual habit, the nervous habit, is a symptom itself, and sometimes it is a cause. I would like to take the curse off the so-called nervous habit of playing with the genitals. It is not nearly so serious as most people think. Boys do not begin to play with themselves until they get to be ten or 12 years old. Girls begin generally about the age of 3 or 4 years. They do not coincide. It is rather interesting to take the sex life of a boy and the sex life of a girl. They cross over. As one begins, the other stops. We must realize that children do have a sex life, and the maladjustments are the basis many times of these nervous habits, which we prefer to call emotional states.

The one that causes more trouble than anything else, I think, is the condition of inferiority. The parents take an entirely different point of view toward the child. The mother protects and spoils him. The father dominates. As a result, the child becomes fearful of the father and loves the mother too much, or he is loved by the mother too much and runs to her for protection against the father. The child develops a feeling of inadequacy, inferiority; in fact, that is probably our most common emotional state: inferiority first and a state of anxiety second.

You must never ridicule a child; never allow him to feel inferior. We must build up the child's ego as much as possible. Do not make the child conceited, but let him feel that he can do things. Praise the child in a quiet way—"That's the boy, son." "That is fine, Mary. You did very well"—and go on about your business. Do not make too much of a drama out of it; do it quietly and unobtrusively. Remember how we like to have our own little egos built up. Well, that is as it should be, but remember that it is more important to the child to build up his ego, and the proper persons for such a job are his own parents. Instead of ridiculing our children or poking fun at them, we would do well to concentrate on building up their little egos. In that way we will prevent many of these emotional maladjustments.

What are we going to do about these things? Of course, you realize that I have not touched upon one-tenth of the various emotional states from pyromania to echolalia (that nervous habit in which the person repeats the last word or two of a sentence that was just said) to echopraxia (in which, if you start to scratch your head, the other person scratches his head in the same place, the other person duplicates any movement that you might make). This is where we begin to get on to the symptoms of the insanities, and I am not going to touch upon them.

I thought you would like to have me touch a little bit upon the therapy. It is all very well to analyze, to classify, and get our terminology, but what do you do about these things? There are many things to do. The first is to look into the environment of the child. What is the family situation? The personality development of the oldest child in a large family would be quite different than that of a child the same age who was an only child. The personality development and the emotional states of an only son in a family of three or four sisters or of a child born ten or twelve years after the other brothers and sisters are things to be considered. Do the father and mother get along very well? I want to tell you a little personal incident that I am sure you will appreciate. Perhaps you may remember that some time ago the Parent-Teacher Associations were complaining about the radio programs with these thrillers, something like Orson Welles' "Men from Mars" program that made such a fuss. While at a Parent-Teacher Association meeting I said that the chairman of the committee must have been quarreling with her husband and that was the reason her child had nightmares. Immediately I sensed something in the audience. There was considerable buzzing and whispering. I looked at them and looked at the chairman and tried to figure out just what it was. After the meeting was over, I was told that the chairman had just been divorced from her husband. This sort of thing does bring about nightmares in children. I am giving you this illustration as I did with left-handedness, to try to get you to understand these emotional states by going back to first causes.

Sometimes we have to take the child away from the family. I came down this morning from my farm in New Jersey where we are establishing a school for children who should be taken away from their parents. We have to explain things to these children. You would be surprised how the children will understand the explanation of left-handedness and the explanation of any sexual habit they might have when we tell them the truth.

People say to me many times, "How much should we tell a child about sex, God and babies?" I answer, "There is only one principle. Be sure that you tell them too much and too soon, rather than too little and too late." Children have a capacity for understanding these things much better than you think. In order to persuade them, try the DuBois method of persuasion: "Don't you think it is better to do this? This seems to be nicer, don't you think so?"

When I had a clinic in the Hebrew Orphan Asylum for curing nail-biting in girls, we started a course in manicuring and taught every girl how to manicure. They manicured each other. One of the first things that I said to a girl when she came into the clinic was, "Mary, let me look at your fingernails." We soon stopped the nail-biting.

Then we use autosuggestion. That is a very powerful technique. We believe more fully in the stronger method of relaxation than that of direct suggestion. I would like to talk to you just a little bit about that because it is so interesting and so universally misunderstood. Of course, you have all heard of hypnotism. I want to tell you as a psychologist that there is no such thing as hypnotism. There is no such thing as the hypnotism in *Trilby*, nor is it

possible to do anything such as is shown in these cheap illustrations where someone stares at another and makes him do something that he does not want to do. It is simply impossible. Anything that is termed as hypnotism, you will find to be a matter of autosuggestion. Perhaps some of you may remember when I used to speak over WOR on Sunday afternoons. Over the air, I relaxed people and actually put them to sleep. I would say, "Now, I am going to teach you how to put yourself to sleep so that those of you who are troubled with insomnia can help yourselves." Certainly there could not be anything passing between me and these people. After I felt that I had put them to sleep—those I could get to sleep—I gave them the command that they must, as soon as they had awakened, write me a postal card or a letter telling me that I had put them to sleep. The first time we did it, we got 750 pieces of mail with more later.

You have probably heard about painless dentistry through hypnotism. I do not know just how effective that sort of thing would be. It is by the method of relaxation and autosuggestion that we can cure these emotional states, remove them, adjust them. For these nervous habits that we have talked about, it is the best weapon we have. I could teach you people to relax inside of fifteen minutes or half an hour quite easily. There is no harm that can possibly come from it. It is only intelligent people who can be relaxed or "hypnotized." That is true, in spite of the fact that people say it is only people with weak wills who can be relaxed or hypnotized. That is not so.

Let me give you one little illustration. Tonight, when you are in bed, or when you lie down at any time, imagine there is a hole right in the front of your forehead. Try to see it; try to see through it. Then try to see only black through that hole. You will soon find that your body will begin to tingle and get numb, and it will be very easy for you to fall asleep.

After we get the person completely relaxed that way, then we talk to him and give him the positive suggestions that he is going to be strong; he is going to be well. Incidentally, if any of you want to cure a child of nail-biting, stealing, lying, or bedwetting, go to the child just after he has fallen asleep and say to him, "All right, Johnnie. Lie down and go to sleep." It is better for the mother to do this sort of thing, although in many cases the father will do. Let us suppose it is bedwetting we wish to cure. Simply stand a distance away from the child's bed and quietly and calmly say to him, "This is Mother. Mother loves you very much. Mother wants you to grow to be a big, fine, strong man. You are going to do only the things that strong men do." You must never say, "You are not going to wet the bed any more." That is negative. You must say, "And you will wake up tomorrow morning with a perfectly dry bed." This is a positive suggestion.

For years we had someone working on the problem of bedwetting, and we could never cure even one case. When we discovered this method and went to work at it, we cured all of them. We cannot claim 100 per cent cures of course, but we certainly made a very great improvement. We maintain that bedwetting is the result of a state of anxiety.

THE ANALYSIS OF A COMPLICATED CASE UNSUCCESSFULLY TREATED

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THE case to be presented is an interesting one from the standpoint of classification and treatment. Although the final result is unsatisfactory, I learned much from the complications that appeared and I feel a discussion of the treatment will be helpful to all.

The patient, a girl of nine years of age, was small and slender for her age, giving one the impression of a delicate physique. However, her history elicited the fact that she was a healthy baby, was breast fed and had had no severe illness. She had the usual contagious diseases of childhood but none of them severely. She did not have scarlet fever.

Although a mouth breather, the pharyngeal tonsils were not markedly hypertrophied and she had had no operation on her faucial tonsils.

She sucked her thumb moderately as a baby. Her mother stated that her chin was very poorly developed at birth.

Her deciduous teeth began to erupt at the third month. She walked at about eighteen months. She was a hay fever victim, thus showing an allergic condition. Her lips were flabby and hypotoned but her buccinator muscles and the mentales muscles were hypertrophied. She presented a markedly perverted swallowing habit in that she sucked in the lips and thrust her tongue forward against the maxillary incisors every time she performed this functional act.

The etiological factors were enumerated as follows: a prenatal failure in mandibular growth; faulty metabolism resulting in poorly calcified osseous structure; mouth-breathing and perverted swallowing, producing local changes in jaw growth and tooth positionings.

The prognosis was considered unfavorable for a result above 85 per cent of normal.

The estimated time of treatment was a year and a half to two years of active treatment, followed by a rather lengthy period of retention because of the habit problems that were associated with the case.

The diagnosis was malocclusion.

Case analysis for classification and treatment proved to be exceedingly interesting and important. On the right side, Figure 1, A, the inclined plane adjustment of the first permanent and second deciduous molars and first premolar teeth is correct. If we limited our conclusions as to classification upon this factor alone, there would be no question but that we were dealing with a Class I case as far as the right side is concerned.

Read before the New York Society of Orthodontists, New York, N. Y., Oct. 31, 1938.

Turning to the left side, Fig. 1, B, we find that a similar inclined plane condition of the permanent molars prevails, while the deciduous molars and first premolars are in end-to-end relationship. This, in turn, indicates a Class I case.

But, as Dr. W. M. Thompson emphasized in a paper before this Society last year, which has just appeared in the October number of the *American Journal of Orthodontics and Oral Surgery*, inclined plane relationship is only one factor to consider in classification. The axial positioning of the teeth is of even greater importance. So we will now take up this factor for consideration.

Turning again to the right side of the model, Fig. 1, A, we note that the maxillary incisors are in slightly exaggerated labial axial position. The maxillary first premolar shows a decided mesial axial perversion. The maxillary molars are in correct vertical axial inclination. From the lack of sufficient room for the maxillary canine and from the mesial inclination of the first premolar, it can be deduced that the maxillary buccal teeth on this side have moved slightly forward from their correct relationship to their bony base. This would explain the lack of correct relationship in the adjustment of the maxillary and mandibular first premolars and place this case more perfectly in Class I, for the molar relationship would still be within the range of normal inclined plane adjustment.

In the mandibular denture however, we note a distinct mesial axial inclination of the right canine and first premolar. The canine is overlapping the lateral incisor, as shown by the front and occlusal views (Figs. 2 and 3). The incisors are not lingually displaced on their base, as they show no lingual axial inclination exclusive of the mandibular right lateral. Therefore, we must transpose this mandibular buccal segment, which unquestionably has shifted forward, to a position that is in normal relationship to its bony base. The transposition required is so extensive as to throw the mandibular teeth into distal relationship with the maxillary teeth and a Class II adjustment of inclined planes is now effected.

On the left side we find almost duplicate modifications of axial positions in the maxillary arch, indicating a slight forward movement of the buccal segment which is now mentally compensated for. In the mandibular denture the left canine is not in mesial axial inclination, but in distal axial perversion. Careful study of this faulty axial position shows very conclusively that here is one of the rather unusual cases in which we have a bodily forward movement of the canine. It may be explained in this case very well. If you will note the location of the mesial marginal ridge of the mesially inclined first premolar, you can observe that it is acting as a perfect fulcrum for a force exerted against the canine crown, to effect a forward movement of the root. The lip, in this case, furnished the power for putting such a lever in action, and we have as a result, a distal and somewhat lingual axial inclination in a canine that is too far forward on its basal bone. The first premolar leaves no doubt that the left mandibular buccal segment has moved forward. So, mentally replacing these teeth in correct relationship with the body of the bone, we observe that they assume a distally occluding adjustment with the

maxillary buccal teeth. Now the classification has changed to Class II, Division I. But we are not yet through with our problem. We have not sufficient evidence to confirm either one or the other deduction.

The mid-central lines must now be taken into consideration (Fig. 2). There is a slight lack of harmony here, but this is readily accounted for by the breaking of the contact points of the right canine and lateral. This has permitted a minor shift of the mandibular incisors to the right. Therefore

Fig. 1.

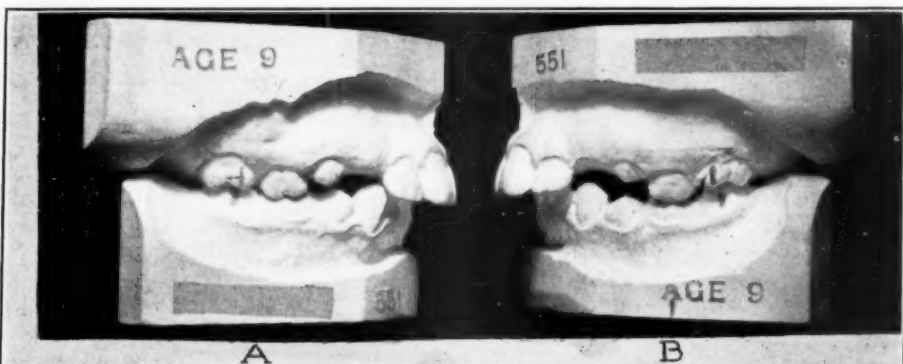


Fig. 2.

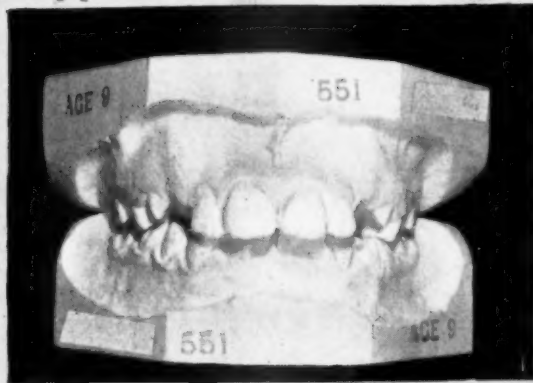


Fig. 3.



in the case we are now studying, the inharmony of the two median lines is of such a minor degree that we may pass it by as having no influence upon classification. It must be considered under treatment, however.

Now let us study the occlusal view of the buccal teeth. A rotation of these teeth, especially the first molars, might be of sufficient degree to cause a forward displacement of the teeth anterior to them and thus modify the inclined plane adjustment (Fig. 3). Here we do not find sufficient rotation to cause

any marked effect on proximal teeth. In the mandibular occlusal view, however, we have evidence of the forward position of the buccal segments.

Our next analytic step takes us to the roentgenograms. Nothing abnormal appears in this case in the way of missing or supernumerary teeth. The X-ray pictures of the premolar areas confirm the perverted axial inclination of these teeth.

Our court of last resort is now reached. We study the photographs, especially the profiles, to determine the relationship of the body of the mandible to cranial anatomy. So far, we have come to two very different conclusions concerning the classification of this case. Our inclined plane analysis shows this to be a Class I case, while our analysis of axial position places the case in Class II, Division I. This is a splendid illustration of how closely treatment is associated with classification. If this is a Class I case, we must move the mandibular incisors and canine teeth forward and buccally to effect harmony in the two arches. If it is a Class II, Division I, case, we will move the mandibular buccal teeth distally and then take all the maxillary teeth distally as a secondary procedure. All of this knowledge concerning the proper method of treatment of this case has been gained during our systematic study of tooth malposition for the purpose of reaching a correct classification.

Now let us study the profile photographs (Fig. 4). My deduction from these pictures is that the body of the mandible is in distal relationship to the cranial anatomy. It is not an exaggerated defect for two very good reasons. First, the characteristic facial expression of lack of forward growth in the body of the mandible is covered up, to quite an extent, by the enlarged mentales muscles. Second, a factor has been at work here, and I wish to place emphasis upon its influence, that has given considerable aid to the mandible in its effort to obtain sufficient forward growth. This has resulted in evolving a much more perfectly formed bone than we would expect to find in a typical Class II lower jaw. Here we have a Class II case with Class I biomechanics in action, so far as occlusal stress is concerned. It was that adjustment of buccal tooth surfaces that dictated a Class I decision, when we considered classification from the standpoint of inclined plane relationship alone. This normal interlocking of the inclined planes (Fig. 1) does not tend to throw the occlusal stress force in a distal direction because the mandibular molars are not forced into mesial axial perversion, with the maxillary molars assuming a distal axial inclination. The occlusal stress force has been delivered along correct vertical lines and hence the bony base responded to the best of its ability and built a bone whose architectural form more nearly approached perfection than in the typical Class II case. I feel very positively that occlusal stress action must be taken into consideration in analyzing the relationship of basal bone to cranial anatomy, for the architectural form of bone is certainly moulded and modified under the influence of functional stress. There is plenty of clinical evidence to support this claim, even though scientific evidence may not be at hand to back up these deductions.

As the result of the completed analysis of this case for the purpose of classification, we now have some very important and valuable data upon which to base our treatment. We find that we have a Class II, Division I case com-



Fig. 4.

Fig. 5.



Fig. 6.



Fig. 7.



plicated by a slight forward movement of the buccal segments of the maxillary denture and a forward movement of the buccal segments of the mandibular denture. The logical plan of correction is quite clear. The primary movement will be the distal shifting of the buccal segments in the mandibular denture until these are placed in their normal relationship with their basal bone. In performing such a corrective movement, we reduce our case to a simple Class



Fig. 8.



Fig. 9.

II, Division I malocclusion. From that point on, we proceed with the routine Class II treatment, which is, of course, the distal movement of the entire maxillary denture until correct occlusal inclined plane relationship is established.

Such a difficult and extensive tooth movement in the buccal segments of the mandibular denture requires substantial anchorage in the anterior section of the mouth and I was very shortsighted in not realizing that the history of the patient and the clinical evidence before me dictated a decision of delaying treatment until better anchorage was available.

So instead of wisely waiting, I began corrective procedures at once. To make matter worse I found a most non-cooperative patient and when Class III intermaxillary elastics were resorted to, in order that I might support the mandibular incisors which were pitted against the mandibular molar teeth, in an effort to effect a distal movement of the latter, the patient wore them so infrequently they were of very little value. Consequently I found my anchorage giving away and the mandibular incisor teeth moving forward. It was not long before the thin labial process of bone at the gingival margin of the two mandibular centrals began to absorb and the gum line dropped rootward. I should have retreated at least at this point and stopped all active efforts, but I foolishly continued until finally I placed all the teeth in proper relationship with one another. Figs. 5-9.

The active treatment was long and tedious for the co-operation of the patient was never developed. When, at last, I obtained a final product it clearly showed the two dentures too far forward in relationship to cranial anatomy. There were also two mandibular incisors with their roots exposed for a considerable distance below the enamel line. Thus did I pay the penalty for overstraining my anchorage.

Failures are not at all comforting to have in one's practice but they can be made of great value if they are studied carefully with a view of profiting by the sad experience. In this manner we can avoid a second series of mistakes of similar character.

What would I do if the same case came today for treatment? I believe the following procedure would be wise.

First—relieve the forward pressure on the mandibular first premolars and canines by teaching the patient to overcome the perverted swallowing habit and by extracting the mandibular second deciduous molars. This would permit the first premolars to assume an upright position and favor an early eruption of the second premolars.

Second: delay all active treatment until the premolars were fully erupted and could be used as anchorage to move the first permanent molars distally without placing undue strain upon the incisors.

Third: when the proper time for treatment had arrived begin and continue adjustments only as long as reasonable co-operation by the patient in the wearing of elastics was obtainable.

886 MAIN STREET

DISCUSSION

Dr. Horace L. Howe.—I wish to compliment Dr. Strang upon his splendid report. His analysis would be altogether different from my analysis. It seems to me as if I could see a lack of proportion between the tooth material and the bone material in that patient. If the tooth material were put into alignment as he did it, the disproportion between the denture and the face is very apparent. I think we will all agree that there was a distinct disproportion in the final photograph. We have two recourses: To reduce the tooth material substance, or produce that disproportion. It seems to me that the orthodontic profession has been carried away altogether too much in the past by their false ideals.

Malocclusion is usually a local expression of a general disturbance, and we are treating children who are not absolutely normal in physical development. Why then, should we ex-

pect to get a normal denture in an abnormal face, in all cases? It is not logical, as the dentures are not entities but part of the whole child.

I think we have put children to an unnecessary amount of agony, only to see the teeth revert in after years because the base bone was not there. It makes no difference whether it has been my treatment or the treatment of others, we have all had the humiliation of seeing reversions. It seems to me that we should profit by research, which shows that malnutrition is the cause, after all, of many orthodontic troubles. We should recognize the fact and correlate the two: research and treatment.

President Rogers.—Does Dr. Strang have any remarks to make regarding the discussion?

Dr. Robert H. W. Strang.—There are two sides to every question and, in reply to Dr. Howe, I will say, thank God for ideals! Where would orthodontics now be had it not been for the fight that some men have waged for the preservation of ideals? Of course many of these individuals were considered to be extremists but the truths that they taught are influencing and guiding us today. It was due to the persistency of these idealists that such rapid advancement in this specialty was made, which, in turn, has made possible the formation of a society as large as this one. Those men were and we, also, are, willing to work for the welfare of a specialty that is, in reality, a science because it is founded upon one of nature's great laws. We should not violate this law except under the most extreme conditions and circumstances. Therefore, and I state this with all the emphasis at my command, while we may err, at times, in preserving teeth, yet such mistakes cannot be compared with the deliberate and planned mutilations that are in evidence as a result of the routine treatment of malocclusion by the extraction of teeth.

THE CHARGE TO THE NEW MEMBERS

HARVEY A. STRYKER, D.D.S., SAN FRANCISCO, CALIF.

THE purpose of the "charge to new members" is to acquaint the new members with the aims and objects of the Society and the obligations that membership involves. To speak very candidly, it is also to remind the older members of these very same points.

The purposes of this Society are to further the usefulness of the profession to the community and to further the happiness and well-being of the members of the profession.

We endeavor to accomplish these ends by sharing technical knowledge; giving each other the benefit of new discoveries, new techniques, new results obtained with old methods, clarifying technical issues by discussion and correlated observations. We strive to form a united front on matters of policy of interest to the profession, as ethics, legal status, standards of admission and such other matters as are admitted into the constitution and by-laws. We promote social intercourse and good will among members of the profession.

In return for these very real benefits, each member has certain individual obligations. These obligations to the Society, as an organization, are very few and simple. They involve prompt and thoughtful acknowledgement of communications from his own elected officers as well as his professional confreres and a readiness to serve on the few committees. His obligations to the Society as an embodiment of the highest aspirations of the profession are, in contrast, very exacting. We should ever keep in mind that what one member of the profession does for good or ill reflects just that much, or even more, for good or ill toward the profession as a whole.

Let there be fair dealing. This is not preaching. On a dollar-and-cents basis in a vocation where advertising is unethical, the individual's new patients come by way of personal recommendation.

It is well that we should remind ourselves that orthodontics, as a special branch of dentistry, is one of the newly arrived learned professions. Many still regard orthodontics as a luxury. This misconception can best be corrected by intensive education. This requires cooperation, loyalty, and unified effort.

If it is true that those who can afford to pay fair fees should be taught to pay them graciously and gladly, it is also true that those who need the service but cannot afford to pay this fair fee should have the benefit of the service at a fee commensurate with their purses. While it is our duty to be charitable, there is a decided limit, consistent with good business and conscientious practice, in the number of cases that can be handled at any one time. We should ever bear in mind that the whole profession is at stake, and if our fees are to be continually lowered, as they apparently seem to be now by certain

Delivered before the Pacific Coast Society of Orthodontists at the eighteenth general meeting of the Society, February, 1939, San Francisco.

groups, it will not be long before the profession of orthodontics will be at such a low level there will be no profit or incentive for those who have the intelligence, desire, and ability.

The problem of meeting the needs of the masses as well as the classes is one which is today engaging the attention of the best minds in the profession. It is one that is not easy to solve. Each member of the profession may do his share in meeting the situation in his own circle, and thus extend in an ever increasing ratio a beneficent influence toward the common end in view. He can do this by increasing the efficiency of his own efforts, thus making it possible to care for a wider range of patients and enlarging upon his sphere of usefulness in a broadened service to the people.

Time spent in modernizing one's office and in systematizing one's daily practice so as to accomplish the best results is just as important as the study of the technical details of our work. Probably no man can conduct a full practice without encountering situations which entail more or less stress, owing to the emergencies which arise unexpectedly, but the stress may be greatly minimized by establishing system and precision in the affairs of the office and by bringing order out of what otherwise would be chaos. The association of two or more orthodontists has many obvious advantages. Anything which makes for greater efficiency in operation works to the benefit of our patients as well as to ourselves.

Any efforts directed toward the inclusion of such modern diagnostic aids as are now at our disposal will markedly assist not only in the education of our patients but in stimulating more careful study and closer observation of existing conditions and thereby remove one of the greatest causes of failure in the practice of orthodontics, that of incorrect diagnosis. I hasten to add, however, that a comprehensive knowledge of growth and development problems is of even greater importance and must be studied carefully by every well-meaning orthodontist.

There are certain amenities having to do with our personal relationships as well as with our obligations to the Society. Your personality, your knowledge of child psychology, your character and reputation are all questions having a real significance in respect to your attitude and relations with your child patients. Alfred Paul Rogers once said, "He is but an indifferent orthodontist who fails to qualify as a teacher to the young life daily under his influence. The very fact that one may teach a child to accomplish some physical development through individual effort may develop a trait of character that in the future may result in the child's being far more of a man or woman than otherwise might have been the case."

The teaching done purposely is not the only kind to which the child is subject at our hands. Their keen little minds are quick to gather ideas from chance expressions that may change their whole moral and spiritual outlook on life—these same expressions of ours being but the result of our own mental, moral, and physical balance or imbalance, determined by the use we make of our leisure hours.

The very foundation of professional integrity is an ever-conscious regard for its code of honor or ethics. As orthodontists, we are foresworn to a deeply

serious life work surrounded by obligations peculiar to that service, which are quite justified by the dignity and esteem bestowed on us in our professional capacity.

The code of ethics of each profession implies that its members are expected to have a "professional spirit" that distinguishes them as professional men from other men. Essential to this spirit is the sense of the distinction enjoyed by an individual, on account of his membership in a profession and of a responsibility to live according to its code of behavior formulated or implied.

Success lies in mutual service, Maurice Maeterlinck says: "One bee can never make honey, for the reason that a bee, separated from other bees, has no intelligence. Bees succeeded only by working for the good of other bees. A single bee separated from the hive is absolutely helpless, yet a hive of bees has a very great and well defined purpose and intelligence." This intelligence Maeterlinck calls the "Spirit of the hive."

"But occasionally, a bee will go off to the fields and come back gorged with honey, bringing nothing for the common stock. And this bee is quickly killed—stung to death by a self-appointed committee who sits on the case and seems to consider that any bee that loses sight of the Spirit of the Hive and works only for a private good is sick, criminally insane, and cannot be allowed longer to take up good space."

No man can stand alone in life, or work alone in a business or profession, and at the same time obtain for himself the same rewards, influence, or happiness, as when he works with and through the organization and the social body of which he is a part. Bees do not ignore this law; man fails when he does.

The practice of orthodontics is an isolated work, and we have but little chance to know our fellow workers except through the medium of our organization. The man who does not embrace this opportunity lives by himself and try as he may, he cannot be in tune with others. Few men can resist the good cheer and elevating influence of a good meeting. It is the influence of these meetings which tends to make bigger, broader, kindlier men—men skillful and learned in their science and more worthy of the respect and confidence of their professional confreres. In unity there is strength, but there is no unity without loyalty.

Our organization needs men who have the desire and the necessary executive and organizing ability to carry on with the work at hand. There is offered here on this great Pacific Coast an opportunity to develop one of the most outstanding orthodontic societies in the world. We seek your earnest cooperation in this direction. In committing you to this idea of service to your organization, I need but to remind you, "he who would profit most must serve best."

In conclusion, let us direct our attention toward making an honest appraisal of ourselves. Let each individual orthodontist take stock of himself, old members as well as new. Ask yourself: Am I skilled? But more than that—am I intuitive? Do I have that gift called "hunch," that turns out right? No matter what school or college you attended, what type of orthodontic appliances you favor, how large and how prosperous your clientele, if you are not convinced deep down inside that you are doing work of a quality and degree of technical skill

which is best for your patients and reflects credit on the profession and yourself, your obligation to this Society is plainly not fulfilled.

What better can be suggested than our own pledge which reads:

The Pacific Coast Society of Orthodontists seeks to exemplify, enforce, and develop the highest traditions of our calling.

I hereby pledge myself, as a condition of membership in the Society, to live in strict accordance with all its principles, declarations, and regulations.

In particular, I pledge myself to pursue the practice of orthodontics in a conscientious manner and to place the welfare of my patients above all else; to render willing help to my colleagues and to be considerate of needy patients; to advance constantly in knowledge by the study of orthodontic literature, interchange of opinion with associates and men of experience, and by attendance at our general meetings; to regard scrupulously the interests of my professional brothers, and to seek their counsel when in doubt of my own judgment.

Moreover, I pledge myself to shun unwarranted publicity, dishonest money-seeking and commercialism, as disgraceful to our profession; to make fees commensurate with the services rendered and within the patient's rights.

490 POST STREET

THE FUNDAMENTAL PRINCIPLES INVOLVED IN THE CONSTRUCTION OF THE LINGUAL AND LABIAL ARCHES

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AS ONE reviews the literature and history of orthodontics, there invariably comes the recognition that we of our generation are the recipients of the results of the earnest studies of those who have gone before us. No present-day technic, now successfully employed in orthodontics, reached its modern position of satisfaction and achievement without many of its advocates and students working unceasingly and with a courageous, yes a divine, discontent to bring it to the stage of dependability which we all enjoy and appreciate. The services our specialty presumes to render as an important branch of the healing art must now, as in the past, be continuously and eternally reinforced by deliberate and ably directed study, by intensive and ideal application, and by the research and improved knowledge which will bring it steady advancement. And just as we, in our day, do not tire of giving credit and praise to those pioneers who have made us the beneficiaries of their manifold efforts, so the practitioners of our specialty in the future will look back, in their day, to our efforts and our open-mindedness in advancing orthodontics.

Orthodontics has made rapid progress. But as the knowledge and proved practices of a branch of dentistry increases, as procedures and principles known to be effective in the prevention or treatment of conditions seen in this field multiply, the responsibility of the practitioner grows proportionately. He must not be satisfied with what he has but must reach forward to still more advancement. "Progress is the law of the universe," and anyone who will not submit to this law not only handicaps himself but also grievously wrongs those whom he should rightfully serve, even a future generation.

Perhaps we shall not go forward rapidly. Real progress in anything is likely to be painfully slow; each advance is inconspicuous; until by almost invisible steps a great improvement is made at last. Our membership has always been receptive to suggestions; new ideas are eagerly sought for and experimented with, thereby adding zest and interest to our quest for a more adequate service to our clientele. It is our present opportunity to consider a step which to me seems an important one in the line of general advance.

When the science of orthodontics comes to its fullest usefulness and the knowledge of its many phases is comprehended and utilized, it is not likely we shall have a universal appliance. There will then be, not a universal appliance, but an ideal appliance to do each thing that orthodontics requires. This statement does not mean that appliances are to be the answer to all

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orthodontic problems. The movement of malposed teeth into what appears to be their normal functional line of occlusion by appliances, without regard to tissue changes, has already been fully revealed as definitely not the central function of orthodontics. Some dentists have realized this fact to their sorrow, after they have made serious errors. Progress toward the establishing of an ideal physiologic activity, not merely the moving of teeth, is the bull's-eye of our target. But even in the matter of moving teeth the large variety of malocclusions and facial deformities which we are called on to treat presents problems too complex, probably, ever to be solved by means of a universal appliance. Every case we treat is an individual problem. Orthodontic therapy can no more be standardized to one universal appliance than can the stars of the heavens be thrown all together into one orbit.

Appliances are our servants; but they do not do all our work for us. They do the lesser part of our work. We need to remind ourselves that orthodontic appliances can do only two things at best: push and pull. Orthodontics is service to physiologic function; pushing and pulling are in themselves only a small part of that service.

I shall discuss the lingual arch. Those who employ the lingual arch believe that, when employment of an appliance is indicated, the simpler the appliance the more satisfactory the treatment. They consider the lingual arch to be the most comfortable, hygienic, and dependable appliance orthodontics has yet found. The problem of complete service to the patient, however, consists of vastly more than this appliance or than any appliance construction.

A standard of excellence for appliances has been well stated by Eby. He declares:

"In the ideal appliance must be found:

1. "Stability of attachment; therefore an appliance which the patient cannot remove.
2. "Dependable resistance in the anchor regions against the sections of active movement.
3. "Ability to control the teeth on individual paths of movement toward the normal, or to control segments of arches collectively.
4. "Susceptibility to reasonable alteration to meet advancing developments. Delicacy or complication of construction should not, however, be the primary consideration, even if it does secure ready readjustment.
5. "A mild pressure producing a stimulation of the osteoclast, which cannot be sufficient to effect the pericemental circulation or to bend bone or produce pain.
6. "Such adjustability in tightening that the exact degree of activity can be measured and controlled at regular tightening intervals.
7. "A pressure so constant as to establish and maintain in the cells a uniform activity and to prevent the shocks which occur under pressure from intermittent, irregular stresses.

8. "Elimination of all false and undesirable leverage—such leverage, for instance, as is produced by a one-point-of-contact pressure against the crown of a tooth, or leverage which will tip the teeth without causing apical movement.

9. "Ability to produce bodily root movement in any direction required.

10. "Cleanliness; freedom from contact against the soft tissues; and insurance against injury to the enamel.

11. "Subserving, partially at least, for preliminary advantages, the correct principles of retention.

12. "Freedom from bulkiness and conspicuousness."

We must always remember that orthodontic appliances are mechanical devices which are intended ultimately to produce new functional relations. Merely as mechanical devices they exert pressure on malposed teeth, thereby influencing cell metabolism with a view to causing the teeth to assume their correct positional relationship. But functional relationship is something more than this. Mershon defines functional relationship as follows: "While we are moving the teeth from their positions of malocclusion to normal functional relations, the tissues surrounding and supporting the teeth will so adapt and adjust themselves through an interaction of forces that the proper equilibrium between teeth and tissues is maintained during the whole process of tooth movement." He further states: "Appliances are effective in proportion as they apply force in the direction of normal growth, and in so doing, do not interfere with the function of any of the tissues associated with the teeth, or with the teeth themselves collectively or individually; each tooth being free to function normally."

An appliance working in conformity with absolute harmony between normal growth and the stimulation of the supporting tissues would be ideal; but as yet orthodontics does not have an ideal appliance. All types of appliances thus far devised have some admittedly bad features; and success in the practice of orthodontics is not altogether due to the appliances employed. Orthodontics which depends entirely on the appliances often comes to grief in its ultimate results. The success of any orthodontic appliance is dependent upon great care and insight in obtaining its correct use in accordance with the particular purposes for which it is designed. Some appliances have been advocated to the profession because they have proved very successful in the hands of a few orthodontists who developed them and used them with full understanding. Yet when indifferently tried by others, these same appliances have failed completely. The reasons are myriad: first, they are not understood; second, they are thought to be simple, foolproof; third, they are ignorantly changed and modified by supposed improvements which absolutely defeat the good qualities for which the appliances were originally developed and designed.

Our problems are being gradually solved, and as in other fields of science, with each advance, more study, investigation and more experimentation result. One hopeful matter of real progress to be noted is that in some of the problems upon which we felt fully informed twenty years ago, we now realize our

ignorance and are sincerely and earnestly endeavoring to solve them. Let us hope that this is one of the growing pains of wisdom. May we never build a wall about ourselves to keep out better ways to serve our day and generation more effectively. May we eternally strive to work for the elimination of the necessity for our services.

The lingual and labial arches present one type of treatment which now has an important place in orthodontic therapy, a place which many of us feel it has gained by long proved practice, by critical experimentation, and by exhaustive application. Those of us who have used the lingual arch in its many diversified forms for more than twenty years have constantly been alert for something more effective, applicable, and dependable. We have always had an open mind and have honestly realized that the lingual arch is neither as perfect as it might some day be, nor the utopian gift which does all things perfectly. Surely we realize its shortcomings, its inability to do all we desire or hope one day to proclaim. We do believe, however, that it can and does accomplish with safety, comfort, and correct physiologic functioning more than any other known appliance is dependably capable of doing. In order to do this, it must, of course, be properly constructed and employed: The lingual arch is used in many, many ways; some enthusiastic advocates claim more ways of successful employment than do others. Some claim perhaps too many; but no one asserts the lingual arch to be the long dreamed of orthodontic universal appliance. It is not necessarily the only good appliance. We need not, in speaking well of it, be destructively critical of other appliances or their advocates and originators.

The lingual arch as employed and indicated today is not a new appliance in orthodontic therapy. It did not come into being or into general use until a large number of workers in dentistry and orthodontics had worked with it and through it. Many of these advocates did original work, as far as they knew; but the fact remains that others before them had also used the lingual arch in a similar, and sometimes in an improved, manner. More progress, improvement, and refinement have been given to the lingual arch in the last three decades than in its previous history, but it has long been used both as a regulating and as a retaining appliance. We have continued the elaborations, improvements, and refinements on the lingual arch until today its advantages and indications are widely admired and appreciated.

In the beginning, orthodontics consisted of aligning irregular teeth. Now, we are treating oral deformities which partially or wholly interfere with normal function, good looks, and health. In the past the object in view was to push or pull teeth into position in the quickest way, almost regardless of the result. Now, we understand that no mechanical device can make and keep a normal occlusion. The individual size and shape of the teeth and the gradual growth of the associated oral structures play a most important part in the quest of modern orthodontics. No appliance working alone can accomplish the ultimate good sought. A proper appliance should be only a stimulus to supporting tissues of the teeth by pressure applied to the teeth. It should work in conjunction with the natural stimulus of growth going on in these

tissues. The dental arch, as a part of the individual, grows with the individual and the stimuli of the appliance and of natural growth must be reconciled, the appliance being the adjustable factor. The rapidity of the work of the appliance must also be limited, as the teeth must not be moved faster than normal growth change permits. Normal growth, if given a chance, will usually accept part of the burden of developing normal occlusion.

Again referring to our definition of the ideal appliance, we find that it must first exert pressure on the malposed tooth; second, it must alter cell metabolism; and then, only as a result of the first and second, can the third purpose be accomplished. This third purpose is that the teeth should assume their proper positions and relation. If only one of these three requirements existed, there would naturally be less liability for undesirable features to arise. We find that the environment in which the appliance is used tends to develop bad features. The appliance should be capable of the things it is supposed to do, as well as to be able to withstand much abuse arising as a result of mastication and the use of the toothbrush. It must be remembered that the amount of space available for the application of the appliances is sometimes detrimental to the construction and design of the appliance. The space in the oral cavity is necessarily limited, and the lips and tongue will not tolerate bulky devices.

The first feature of appliances to be considered is that in all designs seeking efficiency, the appliance, in order to be a success, must be considered according to standard mechanical principles. The question of efficiency is influenced by conditions which we have already mentioned and which now must be related to another important feature: that is, the stability of attachment. Many appliances, which in themselves would be efficient, have been rendered useless because of insecure attachment to the anchor teeth and improper relation to the malposed teeth. Another problem of anchorage is the fact that the slightest amount of pressure exerted upon any teeth, including those used for anchorage, will, if continued sufficiently long, result in tissue change, which will allow the teeth to move as a result of that pressure.

Maintaining stability is one of the most difficult features of the employment of appliances. A large proportion of the unsatisfactory results of orthodontic treatment can be attributed to this one feature. The stability of attachment must be recognized from two points of view: the attachment to the anchor teeth and the attachment to the malposed teeth. The attachment to the anchor teeth, which we call anchorage, will always be a problem because a really ideal anchorage cannot be secured inside the oral cavity. The majority of anchorages employed are obviously unstable, because any given tooth or teeth are always slightly movable. A perfect anchorage has not been found. Recognizing this as a weakness in the beginning, we will achieve greater success if our appliances are designed with this in mind. If we are fully cognizant of this undesirable feature, all limitations can be more or less satisfactorily solved by utilizing the strongest available anchorage at the beginning, then designing the appliance so as to favor such anatomical structures as are present. The second aspect of instability of appliances is the

commonly unsuccessful attachment of devices on the malposed teeth. This feature also has resulted in the failure of many otherwise satisfactory appliances. Even such a simple device as the jackscrew will fail if it has insecure attachment to the malposed teeth. Such an observation can also be made in regard to the alignment wire when used with wire ligatures, or in regard to finger springs not properly secured to the malposed teeth.

Many orthodontists have recognized these undesirable features in appliances. Some have centered such attention on a method of securing the appliance firmly to the malposed teeth that the attachment constructed has defeated the major work of the appliance. The attachment has become so rigid as to absorb the exerted force on the malposed teeth and also to offer sufficient resistance to produce a movement of the anchor teeth.

The very nature of malocclusion is such that when the appliance rests on or touches the malposed teeth, it must be in such a manner as to allow all of the functions of mastication to be performed. This is a physiologic requirement that should not be overlooked, and, likewise, it is one that can only be lived up to with great difficulty with an appliance. Everyone knows that it is necessary for the teeth to function properly, and this very fact is likely to result in establishing insecure attachment. Some dentists go to the other extreme, then, and attach overfirmly. They select the lesser of the two evils. The proper choice really depends on the type of malocclusion which is being treated. Opposed to an appliance is the stress from mastication. This cannot be done away with. But this stress is infrequent, and that of the appliance is continuous; therefore the appliance is the controlling stimulus bearing on the teeth.

Another limitation in appliances and their construction is the material of which they are constructed. That the materials we now have are not wholly satisfactory is proved by the fact that the orthodontists of today are not united in adopting any one material. The best materials now obtainable are far from what we realize that we want and need. We do not yet have new materials but have been compelled to use the materials supplied. Because we are not united in regard to the qualities which the ideal materials should possess, it has been found that a certain alloy, if used according to one technic, will be fairly satisfactory, while if employed differently will invariably be a failure. Therefore, to some extent the limitation of appliances in regard to materials is governed by the technic used and by a particular operator's ability to master the technic and handle the materials correctly. We need to grasp firmly these general facts. Much of our confusion regarding the ideal material for appliances will be overcome when we realize fully that technique and the degree of skill of the operator are closely tied up with the problem.

The use of the lingual arch is different in many respects from that of other appliances employed in orthodontics for regulation and retention. The utilization of this important adjunct in orthodontic therapy has successfully passed at least the early experimental stage, and techniques are becoming fairly well established. There must be, of course, not only a use of the arch but a correct use. Many of us believe the correct use of these appliances will

be of great benefit to orthodontics. Without throwing caution altogether to the winds, I am an ardent advocate of the lingual arch, in combination with the labial arch and auxiliary and finger springs. But I would emphasize strongly the point that skillful technique of employment is fully as important as these appliances themselves. I have shown my faith in and have demonstrated some of the various possibilities and the efficiency of these appliances and some of the techniques of using them. The advantages, in comparison with the employment of some other appliances and their techniques, can easily be demonstrated. Orthodontists who are familiar with the type of appliance which necessitates the banding of a large number of teeth and the construction of essentially complicated and conspicuous mechanical attachments should welcome and should honestly and carefully try this much simpler and less noticeable appliance. They should not employ the arch without also attending carefully to the special techniques which are, in good practice, inseparable from it.

The arch, when properly constructed and used, is one that exerts force upon the teeth in such a way as to cause very little pain and inconvenience. If pain is caused in using this appliance, it is usually a sure sign of improper construction or a fault in technique or a signal of the wrong application of force. While the lingual arch and its combinations possess wonderful possibilities, one should not for a moment infer that it is foolproof or that it can be handled satisfactorily by the uninformed or careless operator. Yet the technique for the proper construction and use of these appliances is not exceedingly difficult. It can be mastered by the average orthodontist if he will seek to understand the fundamentals and will earnestly apply himself.

It is true that in orthodontics, as in life, we fail to agree on many matters which are of material interest to us. And there may perhaps be honest disagreement and honest rejection of the appliance I have advocated. In many matters we do not all yet agree. There is a distinct disagreement between those of us who prefer to use precious metals and those who insist upon stainless steel; between those who insist on directly made bands and soldered joints and bands made on models and spot welded. So, also, we disagree honestly on the material and the types of bands for anchorage, on half-round tubes and posts, and on other matters. Although each of us travels his own path somewhat and keeps his independence and his freedom of choice, we are all seeking the ultimate truth.

Orthodontists are often placed in a false light before the dental profession and the public. We are expected to live up to a great ideal; possibly we have claimed too much and have promised too extravagantly. Perhaps we do not study enough. Orthodontists too often assume the attitude that a fair knowledge of oral anatomy and of function of the dental arches, with their investing structures, added to a grasp of a few laws of mechanics is sufficient to qualify one for successful practice. But orthodontics really is moving far beyond this stage. We are no longer merely correctors by force of dental deformities. We should be scientific men and women, studying always and utilizing our knowledge of all of dentistry, of the basic sciences, of metabolism, of nutrition,

of prevention and preservation, and of functional adaptation of bone and correlated structures. Only as we push forward in knowledge can boys and girls and men and women gain and maintain through us good health and pleasing appearance and the happiness which comes with them. May I urge strongly that we become better students, and because we are, be more charitable toward our dental colleagues and toward each other, even when present theories and beliefs differ.

The lingual arch has a definite, tested, and proved place in orthodontic therapy. As the smiling faces of boys and girls go, year after year, from our office, they show us beyond doubt that this appliance fully merits the place which it has won and now holds.

MEDICAL ARTS BUILDING

FUNDAMENTAL PRINCIPLES OF ORTHODONTICS

ARTHUR L. WOOTEN, D.D.S., WILSON, N. C.

THE purpose of this discussion is to present briefly the ordinary facts about orthodontics which should be familiar, not only to dentists and physicians but, for the most part, to the lay public as well.

Dentistry, which not so long ago was the unwanted stepson of medicine, has now cleared all the hurdles, or at least most of them, and is a welcome branch of medicine. Orthodontics as a specialty in comparison with its sister professions is a mere infant, but a fairly healthy and growing infant.

While we are not particularly concerned in this paper with the history of orthodontics, it might be well to mention the fact that we are not dealing with a new problem, even if it is true that about ninety-nine out of every hundred people you meet do not know the meaning of the word. In the skulls of men who lived forty to sixty thousand years ago there are evidences of malocclusion. And while Hippocrates was recognizing and describing so many other things, he also recognized and described malocclusion. The first mechanical appliance to correct the deformity was used about the year A.D. 1000. The expansion arch which is the basis of present-day treatment was first used by the Frenchman, Pierre Fauchard, about 200 years ago. The expansion arch mentioned here is based on the principle that bone will respond to mechanical stimulus and develop in the direction toward which pressure is applied.

The word orthodontia appeared in dental literature in 1841, and it was defined as "that science which has for its object the correction of malocclusion of the teeth." By 1927, due to recognition of the fact that there was much more involved than just straightening teeth, the following more complete definition was proposed by McCoy: "Orthodontia is a study of dental and oral development; it seeks to determine the factors which control growth processes to the end that a normal functional and anatomical relationship of these parts may be realized and aims to learn the influences necessary to maintain such conditions when once established."

Orthodontics is not necessarily a specialty. Any dentist who is willing thoroughly to familiarize himself with the causes, course, and consequences of malocclusion and who has the patience to master the technique of treatment can do the work. This statement is justified by the fact that about one-third of the sixty-five thousand dentists in the country are combining the treatment of malocclusion with the general practice of dentistry. It is to be assumed, however, that many of these select their cases according to their ability or their desire to treat them.

Until about the beginning of this century, practically all orthodontics was practiced by the general practitioner. At about this time Dr. Edward H. Angle

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recognized in orthodontics something a great deal more important than simply straightening teeth. And he is given much of the credit for stimulating the activity that caused orthodontics to develop into a specialty that had for its purpose not only the straightening of irregular teeth but also the correcting of a deformity that may be, and often is, a detriment to the general health and welfare of the individual.

Occlusion, as the dentist understands it, is the fitting together of the maxillary and mandibular teeth when the jaws are closed. Normal occlusion, as the term indicates, requires that each tooth contact the opposing tooth properly. Malocclusion is any variation from the normal.

Angle classified all malocclusion under three general classes: Class I, the general crowding of the anterior teeth; Class II, the receding chin type when the mandibular teeth have drifted distally; Class III, the protruding chin type when all the mandibular teeth have drifted forward. This type is frequently associated with acromegalia, and when so classed is the most difficult with which to secure a satisfactory result.

We believe that for aesthetic reasons alone orthodontic treatment is justified. The truth of this statement, of course, varies with the degree of the deformity. We would not desire that every set of teeth look just like every other set in the world, nor do we in treatment try to make any set of teeth fit any predetermined pattern. The ideal is to seek a harmony between the teeth, head, and face of which they are a part. It is nature's plan to do that, and sometimes it does so without producing a perfect occlusion. In these cases it is the duty of the orthodontist to determine whether the teeth themselves or their surrounding tissues will be harmed by the abnormality, and if not, to let well enough alone.

While malocclusion is not a disease, we have to approach it as one because it is capable of producing disease and requires treatment for its correction. In addition to the aesthetic reasons already mentioned, the balance of orthodontics is strictly preventive medicine.

The first consideration in the correction of malocclusion is the cause of the condition. There are so many causes that I have not trusted myself to remember them. Instead, I present a list* prepared by Dr. Bernard Wolf Weinberger of New York.

Predisposing causes:

Acute and chronic infection and deficiency diseases.

Congenital and hereditary defects.

Constitutional—children's diseases, syphilis, rickets, and scurvy.

Embryonic defects.

Endocrine imbalance.

Environment.

Faulty development—harelip and cleft palate.

Metabolic disturbances.

Prenatal abnormalities.

Unknown causes.

*Not taken verbatim.

Local causes attending deformations:

Abnormal frenum labium.
 Adenoids and tonsils.
 Cysts, tumors.
 Family traits.
 Feeding, soft foods.
 Habits.
 Mouth breathing.
 Neurosis.
 Nutrition.
 Obstruction of nose and throat.
 Pressure, abnormal muscular.
 Pressure, malfunctioning muscles.
 Pressure, sleeping habits.
 Tongue, abnormal.
 Thumb-sucking.
 Anomalies in number of teeth.
 Contraction of jaw.
 Disproportion in size of teeth and jaws.
 Early eruption of deciduous teeth.
 Excessive number of teeth.
 Abnormal position of germ of teeth.
 Imperfect fillings and restorations.
 Grinding teeth.
 Jaws of one parent and teeth of another.
 Large teeth, small.
 Loss of teeth.
 Malformed teeth.
 Congenitally missing teeth.
 Neglect of supervision of second dentition.
 Nonabsorption of roots of deciduous teeth, and tardy eruption of permanent teeth.

In this last, local causes attending deformation, we get interference with the natural forces of occlusion. The recognized forces of occlusion, six in number, are as follows: normal cell metabolism, muscular pressure, forces of the inclined planes of the cusps of the teeth, normal approximal contact of adjoining teeth, harmony in the size of the arches, and atmospheric pressure.

One of the most common direct medical problems with which we come in contact is the mouth breather. Mouth breathing releases an abnormal muscle pressure on the buccal surfaces of the teeth and at the same time interferes with the atmospheric pressure inside the mouth. The results will be a restricted arch with high palate frequently causing a deflection of the nasal septum and restricted nasal air passages. On the other hand, this very condition, or at least interference with normal breathing, sometimes caused by adenoids, is responsible for the restricted arches and the consequent malocclusion. This restriction of the maxillary arch is frequently the cause of a child talking as

though his nose were partially occluded, as is the case in part. In addition to this, the maxillary sinuses may be so altered as to prevent their acting properly as a sounding board.

As guardians of the public health, we should be conscious constantly of the possibilities of these abnormalities; we should be able to recognize them and be prepared to give intelligent advice. A sound policy to follow as regards time of treatment is to institute treatment, where actual harm is being done, just as soon as it can be determined that nature will not correct the fault.

The final consequences of untreated malocclusion are also an impressive study to me. While in any consideration of the human teeth we cannot overlook the value of beauty, I have no hesitance in stating that function is of far greater importance.

Here is another of those lists which is intended to impress upon us the dire consequences of malocclusion or the loss or impairment of function. The first effect of malposed teeth is imperfect mastication, followed by imperfect digestion, and incomplete assimilation, which produces malnutrition and general undermining of the health. This may be followed by poor application to studies, increased susceptibility to disease and impairment of growth. Then when we have an unhealthy, unhappy individual, we have the question of unfitness for future vocation, with its attendant question of reduced earning capacity and lowered social standing.

The face is disfigured; consequently self-consciousness and, perhaps, an inferiority complex may result. This can and does have its effect on accomplishment. In years to come the individual so neglected may show a definite resentment toward his parents. Common observation will demonstrate that there are many exceptions to this statement. But the statement stands as a fact.

No one with a major deformity confronting him as a reflection in every mirror can take as great an interest in his teeth as if they were beautiful to look at and reflected a joyous perfection with every smile. But, with or without neglect, irregular teeth will be more subject to decay and disease of the supporting structure. And in turn, this pathologic condition loads the system with poison from these foci of infection. You are much more familiar than I with the chronic diseases that follow such infection, and I shall not attempt to instruct you in this field.

The above facts, if taken as seriously as I offer them, can hardly fail to make you to some degree orthodontics conscious. I am confident that such consciousness on your part cannot fail to benefit someone sometime to such a degree that your effort will not have been in vain.

BITE WINGS PRELIMINARY TO ORTHODONTIC TREATMENT*

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FOR several years we have been making a routine practice of insisting upon bite wing x-ray examinations (in addition to full mouth x-ray examinations) in each case presented for orthodontic treatment. By this means we have discovered many areas of incipient approximal caries in patients of all ages. What appears particularly important is the frequent incidence of approximal decay found in the premolars and molars of youngsters around 12, 13, and 14 years of age. While we are not prepared to definitely state reasons for this characteristic occurrence, we feel that changes of adolescence such as variations in the blood chemistry, glandular imbalance, or metabolic disturbances may exert a definite influence upon the production of caries at this time. It is a time of rapid skeletal growth, and possibly this produces a drain on the available calcium supply. In addition, the premolars and molars, approaching their final positions, often develop faulty approximal relations, so that food wedges between them to a great extent. Also these premolars and molars have often been in intimate contact with carious areas in the deciduous molars. Whatever the cause, we have found incipient approximal decay in more than 50 per cent of cases presented for orthodontic treatment between the ages of 11 and 15 years. The significant point is that with the aid of the bite wings, we are now finding this condition before we put appliances on, not during or after treatment. Much of the nonsense that is still heard about appliances causing decay can now be exposed to the light of day.

1726 EYE STREET

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LESIONS OF THE TEMPOROMANDIBULAR JOINT

JOSEPH BUCHMAN, M.D., F.A.C.S.,* NEW YORK, N. Y.

THE study and the treatment of the temporomandibular joint are fraught with many difficulties. Both the dental and the medical professions are vitally interested in these lesions, yet neither of them has made a profound study of these conditions. The dentist has considered the lesions of the temporomandibular joint to lie within the scope of the surgeon, while the latter has relegated these conditions into the field of dentistry. Actually, neither is capable of treating these affections alone for the one must depend upon the other. The dental surgeon is more conversant with the local causes and effects as expressed by the dental apparatus, while the orthopedic surgeon is more conversant with the physiology, pathology, symptomatology, and therapy of the joint for the temporomandibular articulation is subject to the affections of all other skeletal joints and its response is similar to that of other joints.

Another deterrent to a more thorough understanding of the temporomandibular articulation is its highly complicated anatomical structure (Fig. 1). Its bony components are the condyle of the inferior maxilla and the glenoid fossa of the temporal bone. The condyle is olive shaped and its long axis runs inward, backward, and slightly downward. The glenoid fossa of the temporal bone receives the condyle in its anterior portion which is limited in front by the eminentia articularis while its posterior portion lodges a segment of the parotid gland. Posteriorly the fossa is limited by the thin tympanic plate which separates it from the external auditory meatus. The articular portion of the fossa as well as the condyle of the mandible is covered with hyaline cartilage.

Interposed between the fossa and the condyle is a most highly specialized and complicating structure, the interarticular fibrocartilage or joint meniscus (Fig. 1). The disk sits like a cap over the condyle and divides the joint into two cavities thus actually forming a meniscotemporal and a meniscocondylar joint. The disk (Fig. 2) is dome shaped and is accurately applied to the convexity of the condyle. There is invariably a decided thickening in its sagittal plane over the summit of the condyle (Fig. 3). Immediately in front of this thickening is a distinct depression which fits the eminentia articularis

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*From the Service of Dr. Samuel Kleinberg, Hospital for Joint Diseases, New York.

of the temporal bone. Below and anterior to this depression, is the thickened anterior border of the disk. The forward movement of the disk is controlled by a motor mechanism which is exerted through the insertion of the upper portion of the external pterygoid into its anterior and inferior rim. There are some observers who believe that the temporal and masseter muscles are also involved in this mechanism through an insertion of some of their fibers into the anterior and outer rim of the disk. The posterior motion of the disk is passive and is exerted through its attachments to the condyle. The importance of this meniscus is paramount for, as will be pointed out later, it is the source of all internal derangements of the joint.

A thin loose capsule encloses this joint (Figs. 4 and 5). The capsule finds attachment above to the circumference of the temporal fossa and immediately in front of the articular tubercle. It then descends downward to find attachment to the upper margin of the meniscus and from the lower border of the disk to the neck of the condyle. The joint is thus divided into two distinct cavities, the meniscotemporal and the meniscocondylar, each of which has its independent synovial lining.

The capsule is re-enforced on its outer aspect by the external lateral ligament (Fig. 4) which consists of two bands, the posterior of which is the most important of all. These arise from the lateral surface of the zygoma in front of the tubercle and extend downward and backward to insert into the lateral surface and posterior border of the neck of the mandible. On the inner side of the capsule there are several re-enforcements which arise from the Glaserian fissure and the base of the spine of the sphenoid, extend downward and outward to insert on the posterior border of the condyle and the neck. The sphenomandibular or internal lateral ligament (Fig. 5), which is not in intimate contact with the capsule, arises from the spine of the sphenoid to insert into the lingula of the mandibular foramen. The external pterygoid, the internal maxillary vessels, the inferior alveolar vessels and nerve, and a lobule of the parotid gland lie between the latter ligament and the ramus of the mandible. The pterygomaxillary ligament extends from the external wing of the pterygoid to the lingula of the mandibular foramen. Finally the stylo-mandibular ligament arises from the styloid process of the temporal bone to insert into the angle and posterior border of the ramus of the mandible.

The mechanics of the temporomandibular articulation are the most complicated of any joint in the human body and, therefore, add greatly to the difficulties in our appreciation of the joint. One has only to realize that each articulation is really composed of two joints, the meniscotemporal and the meniscocondylar articulations. Furthermore each temporomandibular joint is intimately influenced by that on the opposite side. In addition to all this, the joint formed by the articulating teeth of the upper and lower jaws further complicates the mechanics of the temporomandibular joints. The human jaw is capable of all the simple and combined movements found in the lower forms of animal life, namely: the hingelike rotary motion; the gliding antero-posterior motion and some vertical motion; by alternate action of the homologous joints, lateral motion; and by a combination of all these motions, circumduction.

A primary consideration of the hingelike motion which results in depression and elevation of the jaw reveals that the axis of motion is not through the articulation but through some point below the condyle, for at the very beginning of the posterior excursion of the angle of the jaw the condyle rotates slightly forward. This axis has been placed by various authors at various points ranging from the axis of the condyle down to the lingula of the mandible. Villain has demonstrated, and many authors have agreed with him, that the axis of motion is fixed at the beginning of motion at the posterior insertion of the external lateral ligament. This axis remains fixed during the first phase of depression of the jaw which results from the contraction of the suprahyoid muscles. The second phase of depression of the jaw occurs when, as a result of the contraction of the external pterygoid muscles, the condyles move forward and downward to mount the eminentia, resulting in a gradual

Fig. 1.

Fig. 2.

Fig. 3.

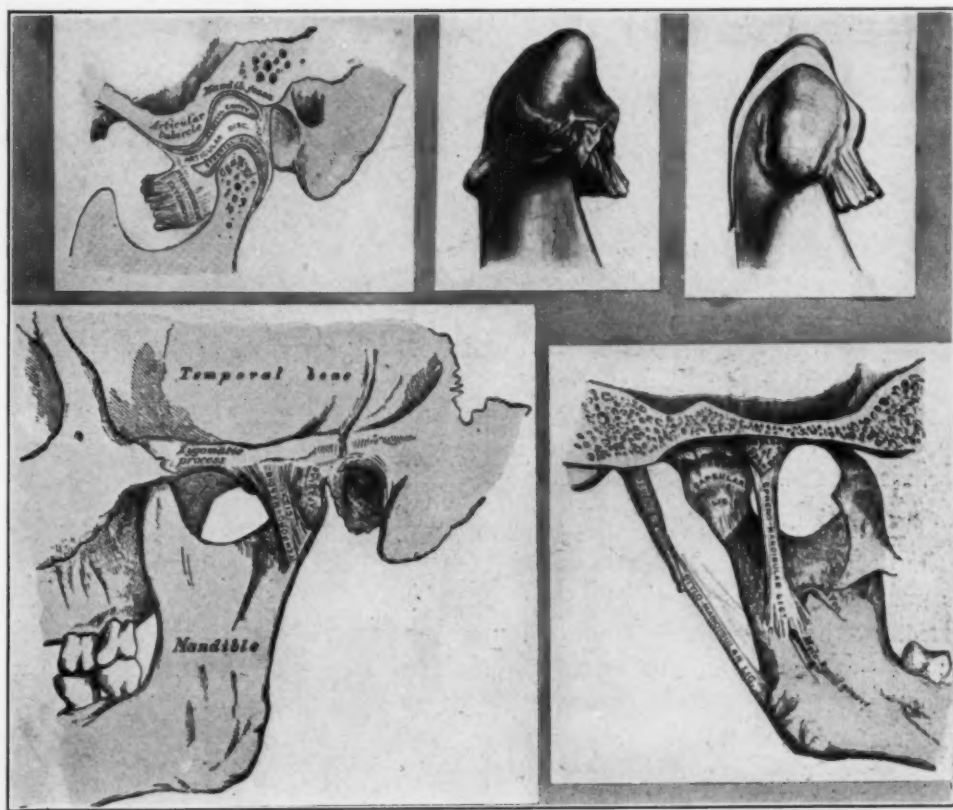


Fig. 4.

Fig. 5.

Fig. 1.—Sagittal section of the temporomandibular joint. (After Gray, Henry: *Anatomy of the Human Body*, Philadelphia and New York, 1918, Lea and Febiger.)

Fig. 2.—Lateral view of the condyle of the mandible capped by the interarticular disk and the insertion of the external pterygoid muscle. (After Pringle, J. H.: *Displacement of Mandibular Meniscus and Its Treatment*, Brit. J. Surg. 6: 385, 1919.)

Fig. 3.—Sagittal section of the interarticular disk showing its varying thickness and the insertion of the external pterygoid below and anteriorly. (After Pringle, J. H.: *Displacement of Mandibular Meniscus and Its Treatment*, Brit. J. Surg. 6: 385, 1919.)

Fig. 4.—Lateral view of the temporomandibular joint to show the capsule and the temporomandibular (external lateral) ligament. (After Gray, Henry: *Anatomy of the Human Body*, Philadelphia and New York, 1918, Lea and Febiger.)

Fig. 5.—Mesial view of the temporomandibular joint to show the capsule and the sphenomandibular (internal lateral) and stylomandibular ligaments. (After Gray, Henry: *Anatomy of the Human Body*, Philadelphia and New York, 1918, Lea and Febiger.)

displacement of the axis of motion anteriorly and downward to the lingula of the mandible at the extreme of motion (Fig. 6). The hingelike motion occurs in the meniscocondylar portion of the articulation, while the gliding motion occurs in the meniscotemporal segment of the joint.

Propulsion of the jaw occurs as a result of the contraction of the homologous external pterygoids. The motion is gliding in nature and takes place in the meniscotemporal portion of the joint. Retropulsion is much more limited and is produced by the contraction of the horizontal fibers of the temporal, the suprahyoid, and the digastric muscles. Lateral motion is the result of alternate propulsion on one side and retropulsion on the other. Circumduction is the result of a combination of all of these motions.



Fig. 6.—Graphic representation of the downward motion of the jaw. RR' , Direction of condylar motion. O , Center of rotation at the beginning of mandibular depression. $OO'O''$, Route traversed by the center of motion as the condyle is moved forward by the contraction of the external pterygoid. II' , Route traversed by the incisors at the beginning of mandibular depression. $I'I''$, Route traversed by the incisors as the center of motion is displaced from O to O' . $I''I'''$, Route traversed by the incisors as the center of motion is displaced from O' to O'' . (After Villain from Dufourmentel, L.: *Chirurgie de l'articulation temporo-maxillaire*, Paris, 1929, Masson et Cie.)

Finally we come to the diagnostic and therapeutic difficulties encountered in the consideration of the temporomandibular joint. The close proximity of the parotid gland and the presence of a lobule of the gland in the posterior portion of the temporal fossa may at times create difficulties in differentiating acute articular inflammatory processes from those of the gland. It is also well to recall that the external auditory meatus is separated from the joint by the thin tympanic plate. As a consequence, suppurative conditions of the articulation may drain into the ear and thus mask the true state of affairs. Conversely suppurative ear conditions may occasionally result in an osteitis of the tympanic plate with a resultant involvement of the joint. The presence of an abscessed wisdom tooth with extensive perimandibular infiltration may sometimes overshadow a secondary suppurative process of the joint. These and other conditions make the study of the temporomandibular joint difficult and complicated.

Roentgenography is of considerable aid in the consideration of this joint but not nearly as much as in other joints of the body. The overlying shadows of other bony structures about the joint prevent the minute and detailed architectural studies possible elsewhere.

Surgically the approach is very difficult. The course of the temporofacial branches of the facial nerve through the parotid gland near the anteroinferior aspect of the joint and the vertical course of the auriculo temporal nerve just posterior to the joint leave but little room for the probing surgeon. The presence of the internal maxillary artery just medial to the neck of the mandible merely adds to the difficulties one encounters in reconstructive surgery.

In view of the above it becomes understandable why a more thorough knowledge and familiarity with the temporomandibular joint is not as prevalent as that of other joints. Fortunately, lesions of the temporomandibular joint are not nearly as frequent as those of other joints and the average surgeon sees relatively few cases. The dentist on the other hand probably sees many more cases especially in their incipency. He, however, seems inclined to pass them by.

With the above discussion as a background we will now undertake to discuss lesions of the temporomandibular articulations under the following headings: pyogenic arthritis, chronic arthritis, traumatic arthritis, fractures, dislocations, and internal derangements.

Pyogenic lesions are relatively infrequent. Infected compound traumas, gonorrhea, adjacent suppurative lesions, and acute infectious diseases such as scarlet fever, typhoid, pneumonia, and others are in their relative order the most frequent causes of suppurative arthritis. Compound traumas whether they be mere perforations or whether they be of the nature of compound fractures will, if they become infected, give rise to suppuration with eventual loss of function in that joint. Gonorrheal suppurative infections have been shown to be most frequent in the newborn infant as a complication of gonorrheal conjunctivitis. At this age period the joint involvement is of short duration and is often undiagnosed, for the preaural inflammation may be attributed to an involvement of the parotid gland. When the suppuration exteriorizes itself, it is usually through the tympanic plate into the external auditory meatus and is, under those circumstances, misconstrued as otitis media. Gonorrheal suppurative lesions of other age periods are much less frequent and are not likely to be of such severity as to lead to complete destruction of the temporomandibular joint. Osteomyelitic lesions of the mandible, especially in conjunction with lesions of the wisdom teeth and on occasion osteomyelitic lesions of the body of the mandible may extend to involve the temporomandibular joint. Similarly, suppurative lesions of the ear may extend anteriorly through the tympanic plate to involve the joint. Occasionally suppurative lesions of the parotid through its close proximity in the fossa may give rise to joint involvement. Of the acute infectious diseases, typhoid and scarlet fever are the most common while pneumonia, influenza, and measles are much less frequent causative factors in the development of an acute pyogenic lesion of the joint.

The pathologic picture that is evolved in the temporomandibular joint is very much that which occurs in any other joint. First, during the mildest phases there is a serous exudate into the joint in the presence of a congestion of the synovial lining. The more advanced stage is a fibrinoserous exudate with a definite inflammatory reaction on the part of the synovia. Finally, in

the suppurative stage the joint becomes filled with pus; the cartilage becomes eroded and destroyed, exposing the bony parts which are now undergoing inflammatory and suppurative changes; and the synovia becomes ulcerated. Once the cartilaginous coverings of the bone ends and the intervening disk are destroyed, the joint is doomed to ankylosis during the process of repair. Such indeed is the fate of all of the more severe types of pyogenic infections of the temporomandibular joint. The pathogenic organisms are usually the staphylococcus, the streptococcus, the gonococcus, and occasionally the pneumococcus.

Symptomatically the local picture manifests itself simultaneously by local pain and by loss of motion. The pain may radiate into the ear and over the face. All attempts at motion are painful, and in the more severe cases mastication becomes impossible. Phonation becomes difficult. Local examination may reveal that the jaw is slightly shifted to the affected side, and the mouth may at times be partially open. Attempts at motion increase the deviation. There may be slight swelling and possibly redness over the joint. Tenderness over the joint line is exquisite. The slightest gentle attempt at passive motion in the presence of suppuration is very painful. The latter two findings, tenderness over the joint line and pain on attempts at passive motion, are of utmost importance in all differential diagnoses. As the process progresses, the suppuration exteriorizes itself, rarely in the pretragal region, more commonly into the external auditory meatus.

The treatment of pyogenic infections of the temporomandibular joint resolves itself into preventive, curative, and reconstruction procedures. Prophylactic measures in the newborn for the control of gonorrheal conjunctivitis are now enforced by law with the result that the ravages resulting from such an infection are now negligible. The progression of such an infection to involve the temporomandibular joint is now, fortunately, extremely rare. Middle ear infections should be treated promptly and appropriately. In the presence of suppuration with a tendency to involve the tympanic plate, drainage through the tympanum should be instituted lest the process extend through the tympanic plate into the temporal fossa. Compound wounds must be treated aseptically and with great care to prevent the development of a suppurative infection. During the early phases of a pyogenic infection, prior to the formation of frank pus, conservative measures such as aspiration, local heat, and rest for the parts are indicated. In the light of the excellent results obtained elsewhere in the body with the use of sulfanilamide in streptococcal and gonorrheal infections, its thorough administration is indicated in similar lesions of the joint. Finally, once suppuration is established, surgical drainage must be instituted to prevent complete destruction of the joint and to prevent spontaneous drainage into the middle ear and external auditory meatus. In addition, general systemic measures must be instituted for the control and relief of the general systemic involvement of which the involvement of the temporomandibular joint is but a part. With the subsidence of the local lesion, gentle active and passive motion must be instituted to mobilize the joint, in the event it has not been entirely destroyed. If the destruction has been complete, ankylosis will follow. Under those circum-

stances an arthroplasty should be performed after an appropriate waiting period. Such a procedure should only be undertaken in the presence of efficient dental aftercare to assure proper apparatus for the mobilization of the lower jaw and the care of the teeth (Cases 1 and 2).

Case 1.—Ankylosis of left temporomandibular joint secondary to extraction of an abscessed molar associated with other multiple osteomyelitic foci.

H. L., Case 35600, x-ray 28857, a 14-year-old female with multiple osteomyelitic lesions of 4 years' duration. Two and a half years ago an abscessed molar was extracted and an osteomyelitic focus was drained from the outside. Subsequently, inability to open the mouth more than $\frac{1}{2}$ inch developed on the left side. The mandible deviated to the left on opening mouth. Patient died one year later from an intrapelvic suppurative lesion. Roentgenogram shows a loss of all landmarks and complete obliteration of the temporomandibular joint.

Case 2.—Bilateral ankylosis of temporomandibular joints.

J. F., Case B12786, x-ray 2-17230, a 10-year-old male, complained of inability to open mouth. Condition arose subsequent to removal of an infected tooth and drainage of a suppurative process from the outside. Thereafter mastoiditis developed on the left side. Clinically no motion was present in either of the temporomandibular joints. Roentgenograms show a loss of landmarks and complete obliteration of both joints. This patient was subjected to a bilateral arthroplasty. Ankylosis recurred.

A discussion of chronic arthritis is fraught with much confusion because of varying classifications and terminology. Suppurative and tuberculous lesions are excluded from this group. The simplest classification and most suitable for our purposes here is to consider these affections under three headings: (1) the atrophic or rheumatoid or infectious forms; (2) the hypertrophic or osteoarthritic or degenerative types; and (3) traumatic arthritis. Traumatic arthritis is closely related in its reactions to the atrophic and hypertrophic groups but is best discussed separately because of its definite etiology and clinical importance. A review of the literature on arthritis reveals a surprising dearth of information with respect to the temporomandibular joint; notwithstanding that the involvement of this joint in atrophic, hypertrophic, and traumatic arthritis is not at all infrequent.

Briefly, the pathology of atrophic arthritis consists of a periarticular and an intra-articular involvement of the soft tissues in a chronic inflammatory process with the production of an effusion into the joint. The synovial lining becomes hypertrophied, and the process gradually extends onto the cartilaginous surfaces in the form of a pannus formation resulting eventually in a destruction of the cartilage and in extreme cases ankylosis of the joint. The process is low grade in nature and may extend over many years with many remittances and exacerbations producing thickening of soft tissues, contractures, and resultant deformities.

It is not at all uncommon for the temporomandibular joint to be involved in this process. Ankylosis of this joint is, however, much less common because of the extensive amount of cartilage involved in the structure of the joint, namely: the two articular surfaces and the intervening meniscus, all

of which act as a protective mechanism. Nevertheless, the periarticular and intra-articular changes are sufficient to produce limitations of functions and associated clinical phenomena.

Atrophic arthritis is characteristically a disease of the young adult, less frequently of the young child, and most infrequently of the aged. Atrophic arthritis may develop during childhood subsequent to an infection of the nasopharyngeal tract or one of the acute fevers. There are probably several forms all of which are grouped under the heading of Still's disease. The onset may be acute or insidious, with or without a primary or recurrent fever and enlargement of the superficial lymph glands and spleen. The proximal interphalangeal and metacarpophalangeal joints, as well as the larger joints of the extremities, become involved in an acute or gradual onset characterized by spontaneous pain, tenderness, local heat, and fusiform swelling. During the early stages there may be an increase of fluid in the involved joints. Active as well as passive motion becomes limited and painful. If complete resolution does not take place, the joint thickenings persist and deformities, subluxations, and limitations of motion develop.

When the temporomandibular joints become involved, pain on phonation and mastication appears in association with local heat, tenderness, swelling, and limitation of motion. The periarticular swelling may persist and the range of motion may be permanently limited. Eventually, when the acute phase subsides, pain may disappear but the limitations of motion may persist. Cracking of the joints and so-called habitual subluxations may supervene as results of erosions and partial destruction of the cartilaginous surfaces and the meniscus and changes in the joint capsule. With the subsidence of the active phases of atrophic arthritis, the joint is left with a deranged form and function which, as a result of continued use, develops osteoarthritic changes because of incongruity of joint surfaces. It is important to note that when arthritis of the temporomandibular joints occurs in early life, the lower jaws do not develop as fully as the rest of the face. The result is typical recession of the mandible. Both joints are usually involved. When the lesion is unilateral, there may develop an asymmetry with a deviation of the jaw to the affected side.

Atrophic arthritis in late adolescence or adult life presents an essentially similar appearance and may supervene acutely during the course of an acute rheumatic fever, or during an attack of acute polyarticular arthritis, or during an acute infection of the nasopharyngeal tract. At times the onset is more insidious. In both instances, lesions with a similar joint distribution as in Still's disease occur. There are other forms in which the spine with or without the basal joints, i.e., hip and shoulder joints, is involved. In these the smaller joints as well as the temporomandibular joints are usually, but not invariably, spared.

In so far as the temporomandibular joints are involved in the adult the clinical picture and course are the same as in Still's disease with the important exception that the facial appearance is not disturbed, for the lower jaw, being fully developed at the time of onset of the disease, retains its normal contour.

The treatment of atrophic arthritis of the temporomandibular joint is the same as that of other joints similarly involved. Locally, rest, physiotherapy, and judicious function are paramount. Systemically, the treatment is legion and includes removal of foci of infection, general building-up measures, gastrointestinal lavage and catharsis, vaccine therapy according to some authorities, chemotherapy in the form of gold salts and sulfur compounds according to others, and climatic therapy. The dentist should play a more important part in the therapy of this condition. The hygiene of the mouth and the removal of dental infections are most important. This, however, is not a license for indiscriminate removal of teeth. Needless removal of teeth is not only harmful but definitely detrimental to the nutrition of the patient. Another very important, though probably less recognized function of the dentist is to relieve the temporomandibular joint of all repeated minute traumas which are incidental to the absence of a considerable number of teeth, improper fitting dentures, and malocclusions. One can readily realize that joints weakened by disease cannot withstand traumas as well as those not so affected (Case 3, Fig. 7).

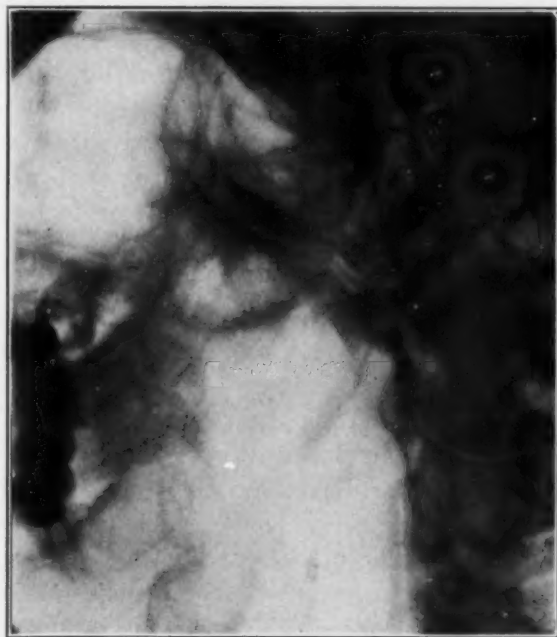


Fig. 7.—Case 3.

Case 3.—Chronic arthritis of the right temporomandibular joint.

M. A., Case 4567, x-ray 39027, a 32-year-old female with a history duration of cracking of both joints on opening and closing mouth for $2\frac{1}{2}$ years. There was marked tenderness over the right temporomandibular point. Opening of mouth was limited to $\frac{3}{4}$ inch. Occlusion of teeth was normal. Roentgenogram (Fig. 7) shows narrowing of joint space and irregularities of outlines of glenoid fossa and condyle. Left side is roentgenographically normal.

Hypertrophic arthritis, osteoarthritis, or degenerative arthritis is now generally considered to be the result of an aging process, the result of wear and tear of life which may be brought on prematurely by disturbances in the

smooth functioning of the various joints. It is a disease of advanced age. In contrast to atrophic arthritis the pathologic process involves primarily the cartilage and bone components of joints. The soft tissues are involved only secondarily and much less conspicuously in the more advanced stages. The process begins with a fibrillation and a wearing away of the cartilaginous surfaces and a proliferation of bone at the osteocartilaginous junctions. As the cartilage is worn away the underlying bone becomes eburnated and osteophytes appear at the margins of the articulating surfaces while the capsule becomes thickened and fibrotic and the joint spaces become narrowed. Motion becomes limited because of impingement of opposing osteophytes, narrowing of joint spaces, and fibrosis of soft tissues. True ankylosis does not occur in this process.

Hypertrophic arthritis is a systemic disease involving all joints in varying degrees with clinical symptoms in but one or at times several joints. The major weight-bearing joints such as the spine, hips, or knees are the most often involved. In the hands, the terminal interphalangeal articulations may be involved in association with thickenings, commonly known as Heberden's nodes. The onset is always insidious and may for a time be asymptomatic. Vague aches and pains and stiffness after periods of rest set in gradually, to be followed by gradual decrease in motion, deformities, increasing pains, and final disability. Premature hypertrophic arthritis occurs in joints which have previously been the site of disease such as atrophic arthritis, or in joints which have previously been the site of a gross deformity, such as may result from intra-articular fractures which have healed without perfect restitution of form and shape, or in joints which have previously been the site of abnormal stresses or strains producing repeated minute traumas.

Hypertrophic arthritis of the temporomandibular joint results in a shallowing of the temporal fossa due to erosion of the eminentia articularis. There is also a wearing away of the cartilaginous surfaces and the discus articularis even to the point of its complete disappearance. In addition the condyle of the mandible becomes irregular and flattened in its vertical diameter and broadened in its anteroposterior diameter. Osteophytes probably appear but are difficult to demonstrate roentgenographically because of overlying shadows.

Clinically, the ordinary type of osteoarthritis of the temporomandibular joint is probably of no great importance. The premature form which results from incongruity of joint surfaces, as the result of previous disease, previous intra-articular fractures, previous repeated minute traumas due to improper articulation of teeth, or absence of teeth, or from traumas incidental to internal derangements, is more common. All of these forms are characterized by an insidious onset of symptoms such as aches and pains especially on mastication or on extremes of motion accompanied by cracking sensations and noises. In extreme cases there are subluxations after varying ranges of motion. Occasionally the joint may become blocked with the jaw in the depressed position and less frequently with the jaw in the elevated position. These dislocations may at times become irreducible.

The treatment of this type of joint in its early stages consists of physiotherapy, judicious rest, and the avoidance of extremes of motion. Proper

dental care to eliminate all traumas incidental to malocclusion of teeth should be instituted and edentulous areas should be supplied with properly fitting



Fig. 8.—Case 4.



Fig. 9.—Case 4.

dentures. In extreme cases surgical therapy may be indicated. These procedures will be discussed under the therapy of internal derangements (Case 4, Figs. 8 and 9).

Case 4.—Hypertrophic arthritis with shallowing of fossae. Symptoms relieved on left side by operative procedure.

T. R., Case J4413, x-ray 2-34958, a 43-year-old woman, complained of difficulty in opening and closing mouth associated with painful clicking of one year's duration. No history of injury. Examination revealed clickings on opening and closing mouth and a bilateral slipping of the condyles. Roentgenogram (Fig. 8) of open position right side shows subluxated condyle, shallow and irregular fossa; Fig. 9, roentgenogram of closed position right side, shows reduction of dislocation, joint space diminished. Roentgenographic study of the left side shows an essentially similar appearance.

On May 26, 1937, the left disk and zygomatic process were removed. One year later there were no symptoms referable to the left side. On the right side the symptoms increased and there was a sensation of snapping in the eardrum on opening and closing of mouth. Clinically there was a slipping of the condyle on the unoperated side, none on the operated side.

Traumatic arthritis of the temporomandibular joints in both the acute and chronic forms is probably the most important of all of the arthritides for it is in these conditions that a great deal may be done in the way of prevention and therapy by both the medical and dental fraternities. Acute traumatic arthritis manifests itself pathologically by an acute sanguineous effusion into the joint which, in the course of time, becomes serous in nature. This is accompanied by a congestion of the soft tissues. If resolution does not occur, an aseptic inflammatory process sets in with resultant hypertrophy of the synovia and pannus formation and consequent extensive destruction of the joint, producing a typical picture of a monoarticular atrophic arthritis. Such extreme degrees of destruction are probably not encountered in the temporomandibular joint because of its extensive cartilage components. The pathology of chronic traumatic arthritis is to all practical purposes identical with that found in hypertrophic arthritis.

Clinically the acute forms may be produced by a sudden force transmitted to the joint as a result of a blow anywhere on the jaw or by a trauma resulting from an excessively forceful opening of the mouth. Such an injury is sometimes the result of awkward and unnecessarily forceful manipulations by the anesthetist during the course of an anesthesia. Occasionally the surgeon, as well as the dentist, is likely to forget that the mouth cannot be forced open beyond certain limits without untoward results. Symptomatically such a joint will express itself by a sudden onset of pain, local swelling, tenderness and pain on motion with limitation of motion. The treatment aside from self-evident preventive measures should consist of rest, local heat, gentle massage and aspiration if the effusion is marked (Case 5, Figs. 10 and 11).

Case 5.—Acute traumatic arthritis with recurrent subluxation on the left side.

G. P., Case 9290, x-ray 2-36998, a 31-year-old female, stated that nine days previously she struck her jaw when she fell against a sofa. Ever since then she has had pain and swelling on the left side. Examination revealed swelling, tenderness, and induration of the left joint. Roentgenogram shows a sub-

luxation in the open mouth position (Fig. 10). Fig. 11 shows the subluxation reduced when the mouth is closed.

The etiological factors in chronic traumatic arthritis are many, the chief of which is the repeated minute traumas incidental to malocclusion of teeth,

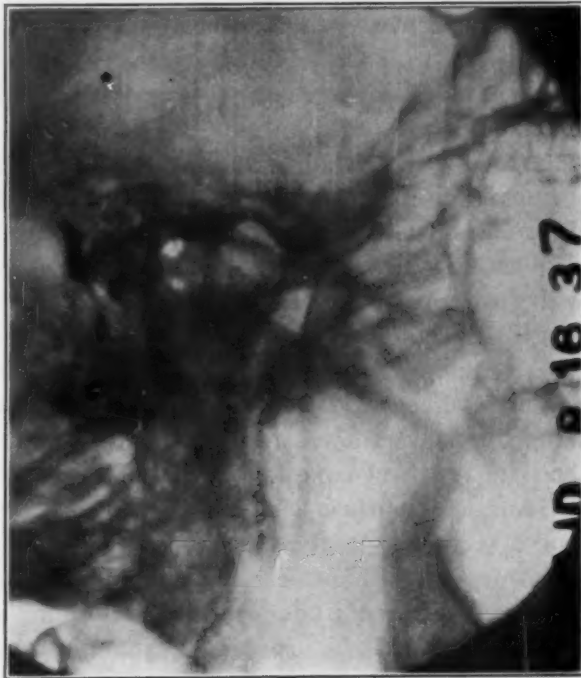


Fig. 10.—Case 5.



Fig. 11.—Case 5.

lack of teeth, deformity of joint surfaces due to fractures or end results of disease or repeated subluxations. Clinically such joints will manifest themselves by pain, limitation of motion, cracking noises, and eventually by subluxations and dislocations. The treatment should consist of preventive measures and the correction of etiologic factors in addition to physiotherapeutic measures and rest. Surgical procedures may at times be necessary in extreme cases. These will be discussed later (Case 6).

Case 6.—Chronic traumatic arthritis with progression of process and eventual bilateral subluxation.

M. M., Case F11633, x-ray 2-29655, a 25-year-old woman, had an impacted left upper molar removed on Aug. 3, 1934. In November, 1934, she complained of pain on the right side after yawning. Roentgen ray studies at that time were negative. She returned in May, 1936, complaining of pain and clicking in both joints, which on roentgenographic examination were found to subluxate in the open position.

The subject of fractures of the jaws need detain us but a few brief moments, for any extensive discussion would be beyond the scope of this presentation. One should, however, keep uppermost the thought that all reductions should be as thorough and complete as possible, lest abnormal stresses and strains result from malpositions which would eventually bring about, in due course of time, a secondary traumatic arthritis. Above all, condylar as well as infracondylar fractures must be given most careful consideration lest incongruity of joint surfaces, be it due to malposition or callus formation, develops. If conservative methods prove inadequate, surgical reposition of fragments is definitely indicated, lest serious damage befall the temporomandibular articulation. Extensive intra-articular crushing fractures with tearing of the meniscus and cartilaginous coverings of the articular surfaces will terminate in ankylosis and necessitate a surgical approach for the relief of the disability.

Dislocations of the temporomandibular joint are practically always anterior. Posterior, lateral, medial, and upward dislocations are only possible subsequent to extreme trauma associated with fractures. These occur only on very rare occasions and, therefore, need not be considered here. In discussing anterior displacements, one must visualize that with every wide opening of the mouth, the joint borders on a dislocation which is only prevented by several factors, namely: the tenseness of the capsule, especially the external lateral ligament; the thickness of the periphery of the disk, which at the extreme of motion lies over the apex of the eminentia articularis to deepen the glenoid fossa; and the prominence of the eminentia articularis. It is evident, therefore, that as a precursor to dislocations there should be a laxity of the external lateral ligament which would allow sufficient leeway for the condyle to jump over the eminentia articularis; or an abnormal laxity of the capsule which would permit greater mobility of the interarticular disk to enable it to be drawn further forward than normal so that the depression behind the peripheral thickening comes to lie over the eminentia and thus acts to lessen the depth of the fossa and so permit a dislocation; or an abnormal lack of prominence of the eminentia articularis thus making the barrier

to dislocation less efficient. A blow on the jaw in the open position may also produce a dislocation. The fate of the disk subsequent to a dislocation has evoked much discussion. It appears, however, that in acute dislocations which were not preceded by abnormal shallowness of the glenoid fossa or by abnormal thinning of the meniscus, the disk remains behind in the fossa dissociated from its motor mechanism. Reduction of dislocations are obstructed by the new lines of tension exerted by the external lateral ligament and the capsule between the disk and the neck of the condyle. We need not enter here into the symptomatology or the therapy of acute dislocations, for they are both well known to you. The point to stress is that once a dislocation has occurred, the tendency to recur is great because of residual laxity of ligaments and capsule and injury to the disk and its motor mechanism. These recurrences may take place with increasingly greater frequency and ease. A recurrent dislocation may on occasion become irreducible due to obstruction by the torn cartilage. This state is in a great measure comparable to a primary dislocation of the semilunar cartilage of the knee, with a subsequent increasing frequency and ease of dislocations until a fracture of the cartilage occurs resulting in locking and irreducibility. If this condition is not relieved, a train of changes, a traumatic arthritis, develops which is very similar in character both in the knee and temporomandibular joint (Case 7, Figs. 12 and 13).

Case 7.—Acute unilateral dislocation of ten weeks' duration reduced by manipulation.

M. D., Case J12809, x-ray 2-38333, a young woman, was shocked by an accident to her husband. On the following morning (Oct. 1, 1937) her jaw became dislocated without any evident injury. No treatment until Dec. 13, 1937, when examination revealed a fixed dislocation on the right side. The mandible deviated to the right on opening mouth. Malocclusion present. No neurological disturbances. Roentgenogram (Fig. 12) shows dislocation on left side. Fig. 13, a post manipulative roentgenogram (2-38455), shows reduction in open position. Range of motion two-thirds normal. (Courtesy of Dr. Adolph Berger.)

The temporomandibular joint is the most highly specialized joint in the human system and is consequently most susceptible to derangements be they the result of recurrent dislocations or the various forms of nonsuppurative arthritis. These have been described as habitual dislocations, subluxations, cracking and snapping jaws. Mullen has aptly spoken of these disturbances as internal derangements. This, to my mind, is a very suitable name for it brings the temporomandibular joint into the family of other joints which present similar though not so complicated pictures. In this group of conditions the eventual displacement may be partial or total, unilateral or bilateral. It may take place at the meniscotemporal plane when the disk is thinned or when the eminentia articularis does not project sufficiently. It may also occur at the meniscocondylar level when the disk is excessively mobile. In the former group the displacement is more likely to be complete, while in the latter it is more likely to be partial. In the latter group the condyle jumps over the thickened rim of the disk and comes to lie against the eminentia,

Internal derangements of the temporomandibular joints are characterized by tears, deformities, and attritions of the interarticular disk. The disk may at times lie loose in the joint detached from its motor mechanism. In those instances in which the internal derangement is based upon a previous arthritis, as well as in those instances of long standing, there are found in addition



Fig. 12.—Case 7.



Fig. 13.—Case 7.

erosions of the articular cartilages of the eminentia articularis and the temporal condyle. In extreme cases these parts may be deformed.

Internal derangements may be initiated primarily by failure of synchronization between the condyle and its meniscus as a result of spasm or improperly timed contractures of the external pterygoid which may be the site of a local inflammatory process or local spasm due to reflex innervation. Occasionally a local anesthetic intended for the inferior mandibular nerve may spread to involve the external pterygoid and thus interfere with proper synchronization. Internal derangements may result from any of the causative factors of traumatic arthritis. They may arise as a result of osteoarthritis or atrophic arthritis of the temporomandibular joint. Persistence of internal derangements will in turn produce and increase arthritic changes.

The characteristic of these internal derangements is that there is a cracking sensation or noise every time the jaw is depressed through a range which varies with the individual. At the onset there may be pain and swelling over the temporomandibular joint. With time this may subside only to recur at varying intervals. Eventually subluxations and dislocations may develop. Under those circumstances a depression appears behind the condyle in front of the ear with every opening of the mouth only to disappear when the mouth is closed. The range of motion may become reduced, and the condyle may even remain permanently anterior to its usual location. At times the joint may become blocked in either the open or closed positions. These are usually reducible by manipulation either by the patient or the physician. More infrequently reduction may be impossible by conservative methods.

The treatment of internal derangements resolves itself into the proper treatment of their causes. Successful treatment of the various arthritides, fractures, and dislocations will prevent the production of internal derangements. Conservative treatment may consist of the application of internal and external appliances to limit the excursion of the mandible for the prevention of the habitual displacements. The objections to this mode of therapy even if successful are self-evident. Injection of irritating substances into the joint to produce adhesions for the prevention of habitual dislocations has in the hands of some therapists given good results. Iodine and alcohol and more recently sodium psylliate are the substances in vogue. This mode of therapy seems illogical for it is merely adding insult to injury and at best is only applicable to those instances which are the result of laxity of the meniscus. The usual sclerosing substance is not selective and, therefore, produces an inflammatory reaction in all tissues with which it comes in contact. Consequently the injection of such a substance would introduce additional injury to a previously damaged joint. Sodium psylliate on the other hand is said to be selective and produces a fibrosis of the capsule without injuring the cartilage. Under those circumstances the use of this substance may be effective. It might be of interest to recall at this moment that injection of irritating substances for the purpose of fixing recurrent dislocating semilunar cartilages of the knee has been used in years gone by but is now generally discarded as being ineffective and not entirely harmless. In the event of failure of conservative methods operative intervention is indicated. Various

operative procedures have been instituted with apparently satisfactory results. These consist of reefing of the capsule, downward reflexion of a strip of temporal fascia to the capsule on the outer aspect of the condyle, and fixation of the interarticular disk anteriorly after its release posteriorly. More complicated procedures aim to create a bone block at the eminentia articularis for the prevention of displacements. Lindeman pries the eminentia downward to increase its prominence while others insert bone grafts from the zygoma or tibia to create obstructions to dislocation. The criticism that may be leveled at these operative procedures is that they are all indirect in their approach and are designed for the control of the dislocations which are only present in extreme instances. The primary disturbing factor is the interarticular disk. It therefore appears that removal of the disc is the most rational procedure. It is a simpler procedure than any of the bone operations and is more certain to remove the annoying cracking symptoms as well as the dislocations when present (Cases 8 and 9). The harmlessness of this operation seems to be definitely proved by Dubecq's experimental and clinical results. It should, however, be pointed out that in some instances the sigmoid fossa is so shallow that removal of the disk is insufficient. Under those circumstances a bone block seems definitely indicated (Cases 10, 11, 12 and 13, Figs. 14-17).

Case 8.—Internal derangement secondary to recurrent dislocation relieved by meniscectomy.

B. H., Case 30036, a 29-year-old woman, stated that in February, 1929, her jaw was dislocated during manipulation by a dentist incidental to removal of a plaster-of-Paris impression. This was immediately reduced, but the patient was unable to open her mouth during the rest of the day. On the following morning there was slight cracking in the left joint. In March, 1929, the patient sustained a redislocation, and thereafter, she was able to open her mouth partially over a period of three weeks. Then the jaw regained its free motion but cracking persisted. In September, 1929, there was a recurrent dislocation. Since that time the patient had to manipulate her jaw on arising in the morning in order to open her mouth. Examination on Oct. 22, 1930, revealed some tenderness over the left temporomandibular joint. The jaw shifted to the left on opening the mouth, and this was accompanied by cracking and pain. The right side of the mouth opened more widely than the left. Several days thereafter, a meniscectomy was performed. The recovery was complete, and all symptoms were relieved.

Case 9.—Internal derangement of the right temporomandibular joint secondary to arthritis relieved by meniscectomy.

E. A., Case 37034, a 27-year-old female, complained of inability to open her mouth fully or protrude her mandibular jaw for indefinite duration. The onset was gradual and began with a snapping sensation on opening and closing the mouth. Pain was present on opening and closing until two weeks before presentation, when it subsided. Examination showed that the right zygoma was more prominent than the left and that immediately below it there was flatness. The condyle was more prominent on the left than on the right. The right temporomandibular joint was sensitive on pressure. The patient was

unable to open her mouth completely. On Feb. 26, 1932, the meniscus was removed. The operative findings revealed that the meniscus was thinned, and that the cartilage of the condyle was eroded and thinned to a very considerable



Fig. 14.—Case 13.

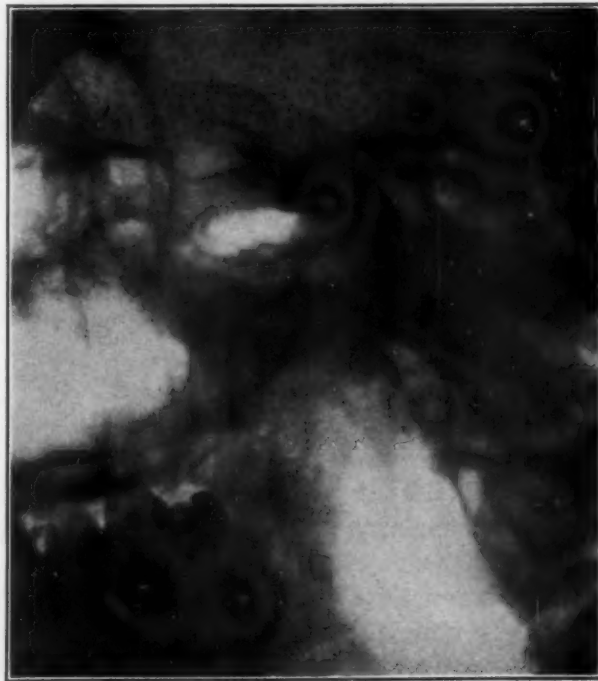


Fig. 15.—Case 13.

extent. The condyle itself presented an angular outline. The patient had an uneventful recovery and was completely relieved of her symptoms.

Case 10.—Internal derangement of the temporomandibular joint without subluxation.

J. M., Case K10195, x-ray 2-42979, a 20-year-old female, complained of pain and noise in the left temporomandibular joint on opening and closing mouth for the past several months. One year previously she had been slapped on the left side of the face. Clinically there was clicking over the left joint with a suggestion of slipping of the condyle. Roentgenograms in the open as well as in the closed mouth positions show normal relationship of parts.



Fig. 16.—Case 13.

Case 11.—Internal derangement of the temporomandibular joint with a bilateral subluxation.

C. B., Case H4009, x-ray 2-29009, a 24-year-old woman, complained of clicking in both joints and pain on opening mouth too wide for the past nine months. Roentgenographic examination in the open position shows a subluxation of the condyle and in the closed position a reduction of the displacement.

Case 12.—Internal derangement of the temporomandibular joints secondary to shallow glenoid fossae.

T. C., Case H2597, x-ray 2-31571, a 20-year-old male, complained of pain in the left temporomandibular joint radiating to the ear and neck. Clinically there was a bilateral clicking and subluxations of the condyles. Roentgenographic examination in the open position shows subluxation due to a very shallow fossa, while the closed position shows a reduction of the displacement.

Case 13.—Internal derangement secondary to recurrent dislocation relieved by bone block operation.

G. S., Case 42025, x-ray 34245, a 26-year-old female, complained of slipping of the right joint every time she opened her mouth. When she arises in the morning, the jaw is locked in the closed mouth position. She is able to unblock the jaw by shifting the mandible from side to side. This is often followed by local soreness. There are in addition aural sensations of jarring and burning. Clinically the condyle slipped forward on each opening of the mouth. Roentgenograms showed a distinct dislocation in the open mouth position (Fig. 14) and a reduction in the closed mouth position (Fig. 15). On March 22, 1933, a bone block operation was performed. Roentgenograms on June 15, 1937, showed a normal alignment of the condyle and fossa in the open position (Fig. 16, x-ray 2-15024) and in the closed position (Fig. 17). The symptoms have been relieved and the dislocation has not recurred to date. The mouth can be opened $1\frac{5}{8}$ inches and the lateral motion is excellent. (By courtesy of Dr. Leo Mayer.)



Fig. 17.—Case 13.

CONCLUSIONS

The dental and medical professions have a joint interest and are interdependent in the study and treatment of the temporomandibular lesions.

A thorough knowledge of the anatomical structure and relationships, joint mechanics, and pathologic reactions is vital for the proper appreciation of the various disturbances that may befall the temporomandibular joint.

The temporomandibular joints react to disease in a manner very similar to other joints which have been more thoroughly studied in the past. The knowledge and experience obtained are, therefore, applicable to the temporomandibular joint.

The causative factors, the pathologic reactions, the clinical picture, and the therapy both from the medical and dental aspects have been presented with respect to pyogenic, atrophic, hypertrophic, and traumatic arthritis.

The concept of internal derangements of the temporomandibular joint has been depicted both as a primary condition and as a secondary condition due to atrophic, hypertrophic, and traumatic arthritis.

It has been developed furthermore that a persistence of internal derangements leads to further traumatic hypertrophic changes indicating the close interrelationship between these various conditions and their effect upon the functions of the temporomandibular joint.

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REFERENCES

1. Axhausen, G.: The Pathology and Therapy of the Temporomandibular Articulation, *Abst. Internat. Abstr. Surg.* 53: 417, 1931.
2. Dubecq, S. J.: Recherches morphologiques, physiologique et cliniques sur le ménisque mandibulaire; luxation habituelles et craquements temporo-maxillaires, *J. de méd. de Bordeaux.* 114: 125, 1937.
3. Dufourmentel, L.: *Chirurgie de l'articulation temporo-maxillaire*, Paris, 1929, Masson et Cie.
4. Mayer, Leo.: Recurrent Dislocation of the Jaw, *J. Bone & Joint Surg.* 15: 889, 1933.
5. Morris, John H.: Chronic Temporomaxillary Subluxation, *Am. J. Surg.* 1: 288, 1926.
6. Idem: Chronic Recurring Temporomaxillary Subluxation, *Surg. Gynec. & Obst.* 50: 483, 1930.
7. Mullen, T. F.: Internal Derangement of the Temporomandibular Joint, *West. J. Surg.* 45: 181, 1937.
8. Padgett, Earl C.: *Surgical Diseases of the Mouth and Jaws*, Philadelphia, 1938, W. B. Saunders Company.
9. Pringle, J. H.: Displacement of Mandibular Meniscus and Its Treatment, *Brit. J. Surg.* 6: 385, 1919.
10. Schultz, L.: Treatment of Subluxation of the Temporomandibular Joint, *J. A. M. A.* 109: 1032, 1937.
11. Villain: Quoted by Dufourmentel.

151 WEST EIGHTY-SIXTH STREET

METAL IN BONE AND SOFT TISSUE

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I HAVE observed metal in the tissues in about 3 per cent of the cases coming to me. It is rarely found in the soft tissue, but more often in the bone. The presence of metal usually results from pieces of amalgam which break off of a filling in a tooth when the tooth is removed or which may fall from the filling in an adjacent tooth into the socket of the one extracted before the socket has healed. Some of these foreign bodies with the appearance of a filling may be due to cement or gutta-percha. The bone heals around them, and they are encased in cellular connective tissue without evidence of infection. Of course, in some of these cases there is definite evidence of infection, and it is necessary to remove the foreign body.

I have observed metal in the bone in a large number of cases and in the soft tissues in some cases as a result of a gunshot wound where the metal has been in the tissue for as many as twenty-five years. X-ray and clinical examinations show no pathologic change in the tissue, and apparently the metal is encased in fibrous tissue with no evidence of infection.

I have also observed many cases of metal in the form of amalgam, gold fillings and needles that have been left in the tissue, have become fibrous, and have remained for long periods of time without evidence of pathologic change.

A good plan, of course, is to remove a foreign body, especially when it is found immediately after operative procedure while the wound is still open and in all cases where it does not involve drastic surgery. Even though drastic surgery is involved, it is well to remove a foreign body if there is an area of infection surrounding it, as shown by the clinical and roentgenographic appearance. Just because a piece of metal is found in the tissue does not warrant drawing the conclusion that it should be removed; in many cases it is very poor surgery to advise immediate removal. Surgery undertaken at a time when the tissues have healed incompletely may involve quite an operative procedure without any justified operative results.

I have observed cases in which pieces of metal were present in the tissue, and in which acute infections developed upon the same side of the face from other causes. Consultants who were called in saw the metal and immediately attributed the infection to its presence.

One of the main reasons for removing metal is to guard against misunderstanding on the part of the patient so that at no subsequent time will he think that he has a foreign body with infection.

It is good practice to take preoperative and postoperative x-ray pictures and, where metal is found immediately after the operation, to remove it. When metal is found in an area that has completely healed and when no clinical or roentgenographic signs of infection or irritation are found, one should be some-

what hesitant in advising surgery. Surgery should be done only in those cases where the history, clinical manifestations, and other features of the case indicate the need for it.

I have observed some cases where metal left in the tissue caused an area of irritation. I have in mind the case of Mr. C., who had a gunshot wound and fracture taking away the entire angle of his jaw. In operating upon him a number of pieces of metal were left in the jaw. He later developed some soreness around a piece of metal along the lower border of the jaw. It caused tissue irritation and nerve irritation which gave him pain which was reflected over the entire side of his face. This metal was removed, and the symptoms of soreness disappeared.

CLINICAL EXAMINATION

In an examination of 713 cases clinically and with full mouth roentgenograms, there were twenty-seven of them with metal present in the tissue or 3.8 per cent. Two of these had more than one piece.

In order to obtain an opinion from outstanding specialists in oral surgery in the leading cities of the United States with respect to their experience and observations of metal in the soft tissue and bone as a postoperative result, the following questionnaire was mailed to them:

1. Do you observe many cases of metal in the soft tissues or bone?
2. Approximately how many?
3. Do you think they may be safely left in place?
4. Do you recommend surgery in all cases?
5. Upon which cases do you operate?
6. Which cases do you leave alone?

Answers to this questionnaire were received from fifty-six different cities representing the leading oral surgeons and the men who have the most experience in this type of work.

In answer to the first question ten men answered, "No." The remaining men answered, "Yes."

In answer to question 2, the replies varied from 0.5 to 5 per cent, with such remarks as: "Maxillary jaw not more than 1 per cent, but mandibular jaw perhaps as much as 3 per cent"; "this year we have had twenty-seven cases"; "one in two to three hundred cases"; "difficult to answer, but not an uncommon finding in the routine work in the clinic where full x-ray examinations are made"; "not so often as in former years; frequently see small fragments of shavings and bone alloy"; "observe cases of metal (amalgam fillings) in soft tissue and bone, the greater number in bone"; "frequently in full mouth roentgenogram examinations we observe evidence of metal in soft tissues and osseous structure"; "occasionally, the most common metal being amalgam which has been fractured loose from the adjacent teeth during extractions."

The answers to question 3 were in most cases, "Yes; most of them"; "sometimes"; and "generally"; four of the fifty-six answered, "No." One of those who answered so stated, "No, with exceptions."

In answer to question 4 all of the fifty-six answered, "No," with the exception of four who answered as follows: "As a rule, yes"; "with few excep-

tions, yes"; "I think they should all be removed as I have had a number of patients receive health benefit after removing metal from the tissue"; "yes."

In answer to question 5, such answers as the following were received: "Depends on patient's general condition, complaint, location, etc."; "those indicating pathologic change in tissue, only such as may be a source of mechanical irritation"; "I operate when no greater damage may result, or when no important structures are involved"; "where infection is present or there is nerve pressure"; "where there is evidence of irritation to soft tissue and structural change in bone"; "usually to satisfy patients"; "where there is clinical or radiographic evidence of pathologic areas"; "those cases which have been referred to me after immediate extraction."

The consensus appears to be to remove metal in the following conditions: as a prophylactic or preventive method when detected before healing of a wound; when it causes irritation of nerve or tissue; when pathologic change in tissue is indicated or if there is evidence of infection.

In answer to question 6, such answers were received as: "The average case of fractured or shattered amalgam or gold filling"; "those showing no evidence of pathologic change"; "needles in the aged and ill if there is no infection present"; "those not showing local or general disturbances"; "where there is no complaint and the areas radiograph negative"; "most of them"; "cases of long standing in which no abnormality exists surrounding the foreign body and patient complains of no disturbance." The consensus is that most of them do not give trouble, and are left alone where they are not giving trouble as indicated by roentgenographic or clinical evidence.

SUMMARY

Metal may be found in the tissues in from 1 to 3 per cent of the cases. Most of them may be safely left alone, and surgery is not recommended in all cases.

It is well to remove metal from open or new wounds when possible and in those cases where there is evidence of suppuration, irritation, nerve pressure or roentgenographic evidence of bone change.

1149 SIXTEENTH STREET, N. W.

FOREIGN OBJECTS IN THE ANTRUM OF HIGHMORE

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THE two following cases exemplify the need for thorough examination and a complete history before a positive diagnosis can be made in some cases that, at first glance, are quite obscure.

Case 1.—A white woman, aged forty years, housewife, came to my office in the summer of 1938.

Complaint.—There was very slight swelling on the right side of the face, but no swelling or redness of the gums. The patient complained of an occasional pain which she could easily regard as unimportant except for an uncomfortable sense of fullness and a postnasal dripping of mucus and pus with a foul odor.



Fig. 1.



Fig. 2.—Arrow points to foreign object in antrum.

The patient consulted several physicians and dentists who, after casual examination, rather flippantly advised her to have her teeth extracted. Finally she was referred to my office. Careful examination of teeth and gums with mirror and explorer revealed no pathosis and no missing or carious teeth. The teeth were not sore to percussion and were normal to thermal changes.

A small dental roentgenogram was made (Fig. 1) that substantiated our first opinion, that there was nothing wrong with the teeth. However, at the upper edge of the film and nearly out of the picture was a shadow that was especially interesting. At first, we thought it might be an unerupted supernumerary

tooth. Closer study convinced us that that was hardly right. Then an antero-posterior roentgenogram of the face was made (Fig. 2). This showed some foreign object in the right antrum. A lateral view was then made; this picture (Fig. 3) disclosed very clearly the nature of the object. Further questioning revealed that a rhinologist had performed a sinus operation for her about two years previously and that an opening had been made at that time through the nasoastral wall of the maxillary sinus for the purpose of curetting and affording drainage. Unluckily and perhaps carelessly, a curette had been broken off and had been allowed to remain in the antrum. I removed the broken off end, about one inch in length, through a large opening through the canine fossa. All symptoms quickly subsided.

Case 2.—Mr. G., aged 33 years, an accountant, was in good health.

Complaint.—The patient had pain and swelling on left side of the maxilla, offensive breath, and postnasal dripping. All of the teeth in the maxilla, 15 in number, were in good alignment; there were several fillings in good condition. Mucous membrane was thickened and red on left side of maxilla. The maxillary left third molar was missing.



Fig. 3.

The patient explained that it had been extracted six months previously and in so far as he was able to judge, it was a very successful operation. The extraction was done quickly and gave him no pain at the time. He went back several times to see his dentist who finally discharged him saying that everything was all right. As time went on, it grew more distressing. There was a sense of fullness, a low growling pain, and a bad taste in his mouth, all of which would be relieved temporarily, by pressing with his finger over the tuberosity and site of the extraction of the third molar. A fine probe could be introduced into a

fistulous opening for a short distance. A dental roentgenogram revealed nothing unusual, simply the outline of an empty tooth socket. There were no retained roots in the alveolus.

At this point in our examination a head picture was taken with the result shown in Fig. 4. The supposedly extracted third molar was found deep in the maxillary sinus just below the floor of the orbit, where it had probably been pushed by the operator in a frantic effort to retrieve the tooth after it had escaped him.



Fig. 4.—Arrow points to tooth in antrum.

The tooth was removed through an opening made in the canine fossa. A large opening through the canine fossa provides an easy and direct ingress into the sinus. It enables the operator to make an ocular examination, lessens the amount of probing and "fishing" with instruments through an indirect opening in the nasal wall or a tooth socket, and lessens the danger of further infection. The process of repair is usually rapid and uneventful.

327 EAST STATE STREET

HAZARDS AND COMPLICATIONS IN THE ADMINISTRATION OF NITROUS OXIDE AND OXYGEN

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THIS paper will consider the additional hazards, dangers, risks, and complications that are presented by obese patients, alcoholics, plethorics, those suffering from organic disease, and all other complications which may arise during the administration of nitrous oxide and oxygen in cases which are not ideal but where, nevertheless, general anesthesia is imperative.

"There are no real contraindications to the use of nitrous oxide and oxygen." This statement of Dr. Lewis S. Booth,³ a physician, led the writer to review the literature. This disclosed that the overwhelming weight of enlightened opinion substantiated this statement, though each writer presents his own statement of facts, conditions, and limitations within which this dictum was confined, namely:

1. When a patient arrives at a public dental clinic, or even in the dentist's private office, for oral surgery or exodontia, because of *an emergency requiring immediate attention* or because of some oral disease which must be eradicated to avoid more serious consequences, contraindications to nitrous oxide and oxygen cannot enter into the operator's cycle of thought if general anesthesia is indicated.

2. When the operation must be performed because *there is no other way* of relieving excruciating pain, or, in extreme cases, of saving the patient's life.

3. When *general anesthesia is indicated*, there is none safer, by a large margin, than nitrous oxide and oxygen.

4. Organic disease is no contraindication but merely requires *modification of technique* of administration of nitrous oxide and oxygen.

Available statistics (running as far back as 1860) would seem to indicate, according to one writer, that from 1860 to 1900 only seventeen deaths were reported from the use of nitrous oxide, and this report covers the use of nitrous oxide without oxygen. In this same period no deaths were reported when nitrous oxide was used in conjunction with oxygen. Ream of Chicago reports no deaths in 30,000 administrations; Teter, no deaths in 12,000 administrations, 1,000 of these administrations having been for major operations lasting one and one-half to three hours. In considering these reports, we must not lose sight of the fact that there are undoubtedly deaths which have never been reported.

Where there are organic or other debilitating diseases, there is greater risk and more danger; thus the services of a skillful anesthetist who takes no part in the operation itself and who devotes all of his time to the administration of the anesthetic and observation of the reactions of the patient to the gases and who can recognize instantaneously, and correctly, approaching complications are required.

A few questions may be asked of the patient to bring out pertinent facts which will be of help to the anesthetist:

For what reason did you last consult a physician? The answer to this question will reveal conditions which will put the anesthetist on the alert for possible complications in long anesthetics for extensive operations.

Do you become short of breath on walking upstairs? If so, the heart should be examined and the anesthetic administered in accordance with the conditions disclosed.

Do you frequently have sharp pains in the chest? If so, suspect angina pectoris and proceed with the knowledge of precautions to be taken in such a case.

Do you or any of your male relatives bleed excessively? Take temperature, pulse, and respiration, and learn the meaning of variations from normal. Learn to use the stethoscope, blood pressure apparatus, and coagulometer and to interpret intelligently what they reveal.

The administration of carbon dioxide, in addition to the nitrous oxide and oxygen, will keep the breathing deep and regular. Without the carbon dioxide, there is a tendency in many people toward shallow breathing. In this event the anesthesia will become light, and the patient may become cyanotic because of the shallow respiration which prevents the subject from inhaling sufficient oxygen to maintain the vital functions.

Surgical shock is undoubtedly present if, after the operation, the respiration is labored, skin moist, cold perspiration, pallor or cyanosis, vomiting, restlessness, lowered blood pressure (which the anesthetist must be prepared to determine with apparatus), mental dullness, lessened sensibility. Body heat should be conserved, rest and sleep encouraged. These symptoms may subside, and then a relapse may occur. In this event the treatment must be prolonged.

There is additional risk where there is respiratory obstruction due to enlarged tonsils and adenoids (found most frequently in children), cellulitis, tumor of the neck or swelling, because the condition will be aggravated through venous congestion. Bad heart lesions without complete compensation, hypertrophy of the heart, high blood pressure, and pronounced arteriosclerosis are conditions which may be met satisfactorily by the administration of a suitable percentage of oxygen (ascertained by experimentation for a few breaths), avoidance of struggling and excitement, and care in maintaining a free airway.

If there is a progressive increase of the pulse rate, shock is developing from some cause. Appropriate measures should be taken to remove the cause by examination of the airway and adjustment of the oxygen and carbon dioxide intake. Increase of the pulse rate, if permitted to continue, may increase the blood pressure in patients suffering from arteriosclerosis with the possibility of cerebral hemorrhage. A fall of blood pressure occurs with strong concentrations of nitrous oxide, but no drop will occur with just sufficient gas to produce anesthesia.

A patient who exhibits crooked arteries over the temples, a hard wall of the radial artery, and a subnormal, irregular pulse rate, must be treated as an

additional hazard, and no untoward reactions must be permitted to occur, and must be instantaneously removed when present.*

Between the most difficult and the extremely easy patient is a whole gamut of variations. Each individual is handled according to the symptoms present and in accordance with the information elicited by the anesthetist through questioning before administration. Every patient may be anesthetized, the alcoholic, the morphine addict, the athlete, the organic sufferer, the debilitated, but these are the difficult cases; they require different percentages of the gases than normal patients, and it takes several minutes more to induce narcosis.

In patients with heart lesions, if the heart rate is increased or decreased, pure oxygen (without nitrous oxide) is respired until the heart action returns to normal. The feebleness of the heart's contractile power in such cases may cause it to cease functioning altogether during the period when its contractile power is partially destroyed by the paralyzing action of the anesthesia. This danger may be eliminated by prompt withdrawal of the nitrous oxide and the substitution of pure oxygen.

Hysteria, epilepsy, paralysis, and other disorders of the nervous system do not involve extra risk, and patients with these disorders may be treated like normal persons. In fact, Colton states that nitrous oxide acts as a remedial agent for their symptoms.

Asthma is not a complication, but particular attention is directed to the air passages. If there are other obstructions to the passage of air, such as enlarged tonsils, it is necessary to resort to the use of the pharyngeal tube as an accessory supply of the gases.

In hyperemia of the liver nausea is quite common due to a retardation of the blood. This may be minimized during anesthesia by reducing the percentage of nitrous oxide or by turning it off completely for a few breaths. To put it another way, the percentage of oxygen is increased or pure oxygen without nitrous oxide is delivered to the patient.

Colton⁵ states that in diseases of the brain, whether acute or chronic, nitrous oxide is entirely inadmissible in a quantity sufficient for the production of anesthesia. On the other hand Teter,¹⁰ the chief anesthetist of the Lakeside Hospital in Cleveland, has repeatedly used nitrous oxide in major surgery of the brain and during the course of such an operation has observed and reported on the physiologic effect of nitrous oxide administration on the brain tissue. Doctor Teter may be accepted as authoritative since his work is more recent, with apparatus more modern and nitrous oxide without impurities more certain.

Patients in an exhausted or emaciated condition from starvation or malnutrition are always bad risks, and fatalities result because of the lowered resistance of the organism, and not because of the nitrous oxide per se. Such a case must be approached with the idea that in all probability it will be a failure, but since the operation itself is imperative, nothing can be done about

*These reactions are referred to in detail in my papers, "Rebreathing," *Dental Items of Interest*, February, 1939; "Physiological Action," to appear in *Dental Items of Interest*; and "Administration," not yet submitted for publication.

it except to exercise the greatest care in maintaining the functions of respiration and circulation without strain on the organs involved.

Aged people, when their condition is uncomplicated by organic disease, are good subjects as a rule. Strict watch must be kept on all signs and symptoms to maintain a good florid color and prevent increased pulse rate. This presupposes, as it does in all cases, an even flow of warm gases with rebreathing and positive interpulmonary pressure.

Children under 5 years of age, because of the presence of large tonsils and adenoids, are a real danger because the airway is blocked by these conditions, and they are easily asphyxiated. They are very easily thrown into epileptiform twitching and assume the opisthotonos position. Unusual care is taken with such patients to avoid and to correct promptly the slightest indication of danger by judicious administration and control and adjustment of the gases, changing the percentages as conditions dictate.

Strong, vigorous men and women require close attention for they become refractory almost without warning and cause much vexation unless the symptoms are recognized before their complete onset. These symptoms may be avoided by using rapid induction and may be aborted by delivering pure nitrous oxide without oxygen for several breaths. The same measures may be used with those persons who use alcohol and tobacco to excess.

Contrary to general belief, ill and anemic patients make ideal subjects for nitrous oxide and oxygen administration, and they require less of the gases to induce anesthesia, with a greater percentage of oxygen in the mixture.

Experiments indicate that in nitrous oxide and oxygen anesthesia respiration ceases first, while the circulatory system continues to function. Resuscitative measures must be resorted to before the heart has stopped. These consist in first bringing the tongue forward and opening the air passages. Pure oxygen is then administered, and artificial respiration is commenced by producing alternate pressure on the rebreathing bag and on the chest. As soon as the first breath has been taken, 1 per cent to 5 per cent carbon dioxide is introduced. This will stimulate respiration and gradually bring it back to normal.

If they are not hospitalized, patients should be asked to remain a half hour after anesthesia, and they should be cautioned against driving a car for several hours. If a synergist, such as nembutal, etc., has been administered, the patient should not be permitted to go home unaccompanied. This is a necessary precaution because patients have been known to lose their way.

CASE REPORTS

The following case reports will serve to illustrate conditions which are met by the anesthetist and the manner in which they are successfully handled.

CASE 1.—An anemic woman, 40 years of age, weighing 110 pounds, was given pure nitrous oxide without oxygen. At the end of the third inhalation, while the ears and finger tips were distinctly pink (they had previously been quite pale), the respiration ceased; the eyelids opened; the pupils were widely dilated; the muscles were completely relaxed; the pulse was weak and regular

but easily felt. Three breaths had overdosed the patient. The lungs were promptly filled with oxygen, and within ten seconds the irises contracted; within a few more seconds the respirations were resumed. It was evident that the nitrous oxide must be diluted with oxygen to prevent recurrence. Nitrous oxide 70 per cent and oxygen 30 per cent were next administered, the same untoward signs occurring within five or six breaths. Again the patient was resuscitated with two inhalations of oxygen. Next 50 per cent oxygen and 50 per cent nitrous oxide were administered, and after several breaths the pupils began to dilate slowly and respiration became weaker. After a breath of pure oxygen was given to prevent further development of overdosage, 40 per cent nitrous oxide with 60 per cent oxygen was next tried. This proved to be the ideal mixture and no further difficulty was experienced. Semiconsciousness for a period of half an hour followed the operation (which lasted twenty minutes). This no doubt was due to the patient's weakened condition and to her anemia.

This case illustrates the fact that a patient may be overdosed with a very low percentage of nitrous oxide without exhibiting symptoms of cyanosis. It also emphasizes the importance of alertness to discover the true symptoms of anesthesia to guide the anesthetist, and the necessity of being prepared to resuscitate a patient with oxygen when respiration accidentally ceases by oversaturation with nitrous oxide. In the normal case, when saturation is first attained, the coincidental anoxemia causes the muscles to become spastic, but relaxation follows promptly when oxygen is restored to the patient.

CASE 2.—Mr. S., aged 65 years, weighing over 200 pounds, presented himself for extraction of all his teeth, which were badly diseased. His coat, vest and collar were removed; mouth prop was inserted and nasal inhaler adjusted. The patient was instructed to breathe deeply, relax, and sleep. After five or six inhalations he became violently excited and reached up, tearing the inhaler and mouth cover from his face. The combined efforts of three people were required to keep him in the chair and prevent his destroying the place. In two or three minutes he was fully himself and much chagrined and humiliated at his conduct, as he was conscious of the fact that he was struggling. He then stated that there had been numerous efforts made to administer nitrous oxide and oxygen to him, all being complete failures because of his violent struggling before anesthesia could be induced. He was very anxious to have his teeth removed, and so he agreed, on the second attempt, to follow instructions exactly. He was informed that the face inhaler would be used, and he was directed to breathe either through the mouth or nose and to imagine he was attending a church service and must keep quiet. The face inhaler was adjusted; nitrous oxide was allowed to flow pure without oxygen; and a few words of encouragement were spoken. He passed into the anesthetic stage without a single movement, and deep anesthesia was secured, taking three minutes. Sufficient oxygen was then added to the mixture to overcome asphyxial spasms. The face inhaler was then removed and the nasal inhaler substituted, the gases being forced through the nose and the mouth packed with sponges to prevent escape of the gas mixture. Anesthesia was maintained without difficulty until the removal of all the teeth, curettement

of the sockets, and trimming and smoothing of the processes were completed. The patient recovered consciousness within one minute and was able to leave the office within fifteen minutes.

CASE 3.—A girl, 18 years of age, had an enlarged frenum to be removed. The central incisors were separated $\frac{1}{8}$ inch. The usual procedure of induction was followed. As the nasal inhaler interfered with the proper performance of the operation in this case, it was used until anesthesia was well established. The pharyngeal tube was then substituted and was placed in the mouth extending to the base of the tongue well back in the pharynx. Sponges were packed in the mouth; the gases were allowed to flow under sufficient pressure to maintain anesthesia. This anesthesia proceeded to an uneventful completion.

This case illustrates the use of the pharyngeal tube where the nasal inhaler interferes with the operation.

CASE 4.—This case of a child, aged 10 years, will introduce the method of approach with children. A special effort should be made to eliminate fright and fear, as an excited patient does not respond readily to an anesthetic. While preparing the child, the conversation is regarding football, basketball, snowballing, paper dolls, or whatever the age and sex call for. By this means the patient's mind is taken from the operation. This child had been to a dentist several times to have teeth removed, but he would never submit to the operation. He was a fine, vigorous, well-built, young athlete. As soon as he was presented, he was asked what school he attended. The anesthetist guessed he was a fullback on one of the teams. His answer was, "How did you know that?" Thus began an animated discussion during which time he was seated in the chair, the assistant placing the towels around him. He questioned what that thing was, and he was informed it was a noseguard similar to a football noseguard. It was then placed over his nose, the gas having been turned on previously. He was directed to blow into it ten times, when it would whistle, and it would then be removed. He made no objection, and of course before the ten inhalations were completed he was unconscious, having at no time made any resistance. On discontinuance of the anesthesia, he awakened in a very few seconds much surprised that his teeth had already been removed. He assured us that he would not be afraid next time to go to a dentist. As a rule, children can be managed much more successfully if the parents are not permitted to remain in the room. The towel that is used when a child is placed in the chair is an old-fashioned roller towel. It is placed over the child's head, confining the arms and hands. This may be done without creating any suspicion of his being restrained. The anesthetist should stand back and to the side of the chair, placing one of his legs through the towel as the inhaler is being applied. If the child should attempt to resist, the leg is pulled back, and the patient can neither slip down in the chair nor raise his hands to pull off the inhaler. Thus the patient is quickly anesthetized without any disturbance. The instinct of life preservation is very tenacious, and any child will naturally attempt to defend himself. As a consequence, an operator should not be unnecessarily harsh with children.

CONCLUSIONS

1. Reports indicate nitrous oxide and oxygen is the safest general anesthetic.
2. Hazards of administration are increased in the presence of organic disease, but disease is not a contraindication to the use of nitrous oxide and oxygen.
3. An expert anesthetist should be used in all complicated cases to avoid embarrassment to patient and dentist.

REFERENCES

1. Allen, W. H., U. S. Army: J. A. M. A., pp. 1599, Nov. 11, 1911.
2. Andrews, Edmund: Chicago Medical Examiner, 1870.
3. Booth, Lewis S.: Keen's Surgery 8: 836, 1921.
4. Clark, H. B.: J. A. D. A. 19: 470, March, 1932.
5. Colton, J. J.: Physiological Action of Nitrous Oxide Gas as Shown by Experiments Upon Man and the Lower Animals, Together With Suggestions as to Its Safety, Uses, and Abuses, Philadelphia, 1871, Samuel S. White.
6. McKesson, E. I.: Nitrous Oxide, Current Research in Anesthesia and Analgesia, Bulletin No. 8, December, 1920.
7. Prentiss, E. B.: Dental Cosmos 57: February, 1915.
8. Seldin, Harry M.: Dental Cosmos 72: May, 1930.
9. Sprague, A. W.: Practical Suggestions for Making and Inhaling Nitrous Oxide, Boston, 1867, Wright and Potter.
10. Teter, Charles K.: J. A. M. A., November 23, 1912; February, 1924; Dental Cosmos, August, 1912.

20 EAST 57TH STREET

Case Reports

This month we present a case of a dermoid cyst of the ovary containing five teeth and bone reported by Dr. Milton B. Asbell from the Baltimore City Hospitals, Baltimore, Md.

Case reports for this department should be sent to Dr. Kurt H. Thoma, 53 Bay State Road, Boston, Mass.

CASE REPORT NO. 24

TERATOMA, DERMOID CYST OF THE OVARY

MILTON B. ASBELL, D.D.S., BALTIMORE, MD.

HISTORY.—The patient, M. W., a white woman, aged 44 years, was admitted to the Baltimore City Hospitals on Aug. 31, 1938, with the complaint of diarrhea and fever for the preceding two weeks. She attributed it to some soup which she had eaten a few hours before the onset. During the

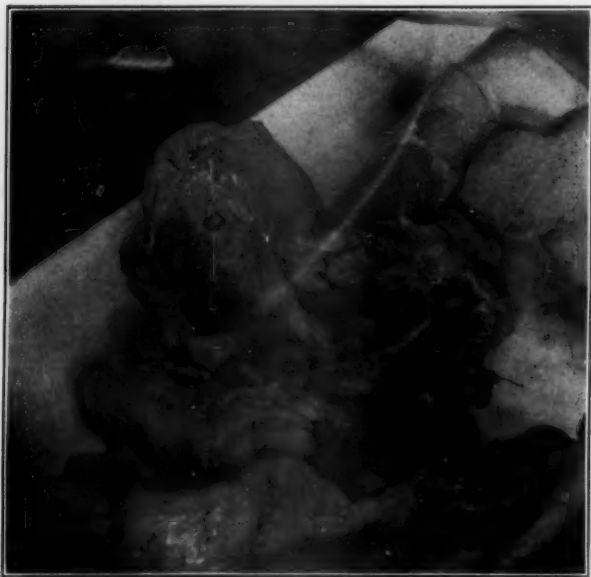


Fig. 1.—A view of the cyst. It will be noted that the gloved index finger is placed under the bridge of fibrous tissue allowing a better view of the teratoma.

first few days after onset, she had generalized abdominal cramps, nausea, vomiting, and bloody stools numbering six to eight per day.

Physical Examination.—The patient's temperature was 102° F.; her pulse, 90; her respiration, 20; and her blood pressure, 80/35. The patient appeared rather drowsy but not in acute distress. Physical examination showed nothing

remarkable. Upon digital examination of the pelvis, no tumor masses or tenderness were noted in adnexal regions. The fundus could not be felt by the examining hand.

Laboratory.—The urine had a specific gravity of 1.004-1.021, albumin 1 plus on several occasions. Culture showed heavy growth of *Bacillus coli*, innumerable white blood cells, no red blood cells or casts. The red blood cells numbered 3,350,000; white blood cells, 17,500; and hemoglobin content was 70 per cent. The differential blood count was normal, Eagle test, negative. Stools showed a positive guaiac test; blood agglutination tests with Flexner v were 2 plus in all dilutions. The tentative diagnoses were bacillary dysentery (Flexner); pyelonephritis due to *Bacillus coli*.

Pathology.—The patient died on Sept. 24, 1938, and the pertinent findings at autopsy were that the uterus was of normal size and the endometrium thin and reddish purple. About the uterus and tubes were thin bands of fibrous adhesions. The left tube appeared normal. The left ovary contained numerous corpora albicantia and one small cyst filled with brownish old blood. The right tube extended onto and finally disappeared into the wall of the pelvic mass. This mass felt firm but cystic; it was roughly spherical and measured 10 cm. in diameter. It was filled with greasy, buttery material. There were a few hairs in the material as well. Its capsule was a thick fibrous wall. The wall was thickest anteriorly, and at that place four calcified bodies were felt. Three



Fig. 2.—Radiogram of the cyst.

of these resembled teeth, but the fourth was smooth, flat, and round. These seemed to arise from a firm, calcified bridge which probably represented an attempt to form a jaw bone. Radiographic examination of the mass revealed five teeth: two resembling mandibular incisors, two mandibular premolars, and one mandibular molar attached to which appears to be a piece of alveolar bone.

Diagnosis.—Dermoid cyst of the ovary, teratoma.

Editorial

Dentistry for Children

NOT unlike the two-price script money plan recently proposed by the Secretary of Agriculture the former Dean of the University of California, Department of Dentistry, suggested a plan before the American Public Health Association for the training of 100,000 hygienists, technicians, and mechanics, over a two-year period in order to train them to perform simple dental operations for children. The inference can be drawn that modern dentists in the dean's opinion, at least, have not the numbers or the physical "horse power" to fulfill a government program that would provide dental care for all the children in the event such a program should be instituted. Then there are the new and comprehensive programs of instruction in public health dentistry being organized by important universities in conformity with the special qualifications which were laid down in the conference of the United States Public Health Service, April 11 and 12, 1938. Much of the activity of the university trained public health dentist obviously is devoted to the creation of interest among the public in a wide dental program for children, also in the education of the general practitioner of dentistry to perform adequate children's dentistry.

Courses are given to provide the dentist with an opportunity to avail himself of lectures on the subjects of child psychology, child development, and child management by specialists in these fields, and much other information is taught that it is supposed will more adequately equip dentists to care for the child dental health problem.

The wide activity manifest from various and sundry sources designed to make both the public and the dental profession dentistry-for-children minded as a major health movement in the realm of modern preventive medicine is beginning to become effective. On every hand there is evidence that dentistry for children is rapidly being "sold," as a subject of great merit and one that should be backed by both vigor and resource.

The question now arises, however, Who is to provide dental service for all of the children of the United States and from whence will come the funds that will be necessary to provide for such a comprehensive program?

One might answer that by saying that the dental profession which now is not overly burdened with work will be glad to supply these services. To this the average dentist, or many of them at least, would, no doubt, answer by saying, yes, insofar as we are physically able to do so and provided we are able to make such a service manifest itself at the end of the year on the net gross profit line of our income tax blank, which heretofore the majority of us have never been able to do only in scattering individual instances.

From the California dean comes the suggestion of the training of 100,000 hygienists and technicians to perform this service and quoting from the New

York *Times* of February 2, 1939, with regard to a statement by Dr. F. Kennedy of Cornell University Medical School: "Dr. Kennedy would end A.B. requirement and start doctors much earlier—Finds Standards Lower—Profession Becoming a 'Union of Gadgeteers' he tells Neurologists' meeting." This is in order to provide wider medical service and at less expense is the purpose of such recommendation.

In the current dental literature of the past five years one can read voluminous articles and journal reports advocating and making fervent pleas for more complete and comprehensive training for dentists, some even advocating the M.D. degree. On the other hand a current editorial in a reputable dental journal advocates more and more dentists at less curricular requirements than now demanded, as an answer to the paradox above pointed out.

All of these unsolved and widely divergent viewpoints reflected among leaders of professional thought focus upon the current dental horizon the dawn of a new day, and great changes are plainly ahead.

It would seem it is time for sane, practical, straight thinking by experienced practical dentists who know at first hand about the grief, the joys, the irksome hours, the physical exhaustion, the patience, as well as the personal satisfactions, that are all intertwined in the solution of any plan that would provide competent and satisfactory dentistry for all of the children of the land. This will be what might be called a rearmament program of great magnitude for dentistry and needs careful and sane guidance.

H. C. P.

News and Notes

Central Section of the Pacific Coast Society

The regular meeting of the Central Section of the Pacific Coast Society of Orthodontists was held in San Francisco, Dec. 6, 1938. The following officers were elected for 1939: Dr. William F. Walsh, chairman, and Dr. Linus A. Huberty, secretary-treasurer. Dr. Spencer Atkinson read a paper for the scientific part of the program.

Washington-Baltimore Society

The spring meeting of the Washington-Baltimore Society of Orthodontists was held March 23, 1939, at the Hay-Adams House in Washington, D. C. The program was as follows: "Some Observations on the Labial Arch," L. M. Christie, Washington, D. C.; "Obtaining and Maintaining Balanced Occlusion," Spencer R. Atkinson, Pasadena, Calif.; "Biology and Orthodontics," Paul Hoffman, Washington, D. C.; and "The Use of a Miniature Camera for Orthodontists," Francis M. Murray, Washington, D. C.

Southern Section of the Pacific Coast Society

The Southern Section of the Pacific Coast Society of Orthodontists held its regular meeting in Los Angeles, Calif., Dec. 9, 1938. Dr. John Taylor read a paper entitled "The Treatment of Deciduous and Mixed Dentures." Dr. George Chuck gave a talk, accompanied by slides, concerning the reasons for employing the ideal arch form in orthodontic treatment and presented a clinic to illustrate the various steps employed in forming the ideal arch. Dr. E. C. Read gave a table clinic demonstrating a method of soldering chrome attachments.

American Dental Assistants Association

The fifteenth annual session of the American Dental Assistants Association will be held at Milwaukee, Wis., July 17 to 21, 1939, with headquarters at the Astor Hotel. For further information address

Lucile S. Hodge, General Secretary
401 Medical Arts Building
Knoxville, Tenn.

Oliver, Irish, and Wood Orthodontic Exhibit

The clinic by Doctors Oliver, Irish, and Wood was originally shown at the American Association of Orthodontists meeting in Los Angeles in July, and later it was shown at the American Dental Association meeting in St. Louis in October, 1938. It was given the Second Award in Division B of the Scientific and Health Exhibit section.

Some 200 photographs illustrating step by step a detailed construction of anchor bands, impression taking, pouring of models, construction of lingual and labial appliances with many auxiliary attachments are shown in the exhibit. It also contains a series of 100 treated cases, giving the models before and after treatment. Many models showing the construction of the appliances are illustrated by the photographs.



Oliver, Irish, and Wood Orthodontic Exhibit.

Mississippi Dental Association

The Mississippi Dental Association will hold its annual meeting at Gulfport, Miss., June 12 to 14, 1939, with headquarters at the Markham Hotel.

GEORGE P. EVANS, Secretary.

Ontario Dental Association

The seventy-second annual convention of the Ontario Dental Association will be held at the Royal York Hotel, Toronto, Ont., June 5 to 7, 1939. Dentists from the United States and from parts of Canada outside Ontario are welcome.

FRED J. CONBOY, Secretary.

Denver Summer Seminar

The fourth annual Denver Summer Seminar will be held at Denver, Colo., July 2 to 9, 1939.

WILLIAM R. HUMPHREY,
1232 Republic Building,
Denver, Colo.

Massachusetts Dental Society

The seventy-fifth annual meeting of the Massachusetts Dental Society will be held at the Hotel Statler in Boston, Mass., April 24-27, 1939. The subject of the meeting will be the "Trend of Dentistry During the Last Seventy-five Years." There will be outstanding speakers from all over the country, a health exhibit, and a clinical program.

DR. FRANK W. ROUNDS, President,
270 Commonwealth Avenue,
Boston, Mass.

Southwest Dental Congress

At the Southwest Dental Congress, the eight states postgraduate meeting, will offer 180 hours postgraduate study in nine sections in Oklahoma City, Okla., April 24-28, 1939.

HARRY H. SORRELS
General Chairman
Medical Arts Building
Oklahoma City, Okla.

North Atlantic Orthodontic Society

The tenth semiannual meeting of the North Atlantic Orthodontic Society will be held at the Hotel Pennsylvania in New York City, on Wednesday afternoon and evening, April 26. All ethical members of the dental and medical professions are invited.

WALTER H. JACOBS, Secretary,
124 West 93rd St.,
New York, N. Y.

University of Pennsylvania Postgraduate Courses

The School of Dentistry of the University of Pennsylvania offers two special post-graduate courses as follows:

1. Four-day general refresher course, including local and conduction anesthesia, radiography, bacteriology, full-denture prosthesis, partial-denture prosthesis, ceramics, gold inlay, periodontia. The course will be conducted by the faculty of the school, aided by well-known specialists in the fields concerned, from Monday, June 5, to Thursday, June 8, 1939, inclusive. The fee is \$10, payable with application.

2. Ten-day course in oral surgery, exodontia, and local and general anesthesia. The course will consist in part of lectures on the subjects mentioned, supplemented by lectures and demonstrations in anatomy, bacteriology, pathology, and roentgenology, pertinent to the clinical subjects. Most of the time will be spent in clinical instruction at the Evans Institute and at various hospitals. This course will be held Monday, May 29, to Thursday, June 8, 1939, inclusive. The fee is \$75, \$25 to be sent with application and \$50 payable at time of registration at the school.

Applicants should state their school and class and dental society affiliation. Courses are not necessarily restricted to University of Pennsylvania graduates, but alumni will be given preference in case the numerical limits are exceeded.

Application for either course should be made to

THE DEAN, School of Dentistry, University
of Pennsylvania
Evans Institute, 40th and Spruce Streets
Philadelphia, Pa.

French Speaking Dentists of North America

The fifth convention of the French Speaking Dentists of North America will be held at Montreal, Mount Royal Hotel, June 8-10, 1939.

DR. GERARD BAILLARGEON
Medical Arts Building
Montreal, Canada

American Association of Orthodontists

The Thirty-Seventh Annual Meeting of the American Association of Orthodontists will be held in Kansas City, Mo., April 17-20, 1939.

Southwest Dental Assistants Association

The Southwest Dental Assistants Association will meet in Oklahoma City, Okla., April 24-28, 1939.

Cleveland Society of Orthodontists

The Cleveland Society of Orthodontists, consisting of the majority of orthodontists of Greater Cleveland and vicinity, have held bimonthly meetings during the past year under the leadership of Dr. Charles Vosmik in order to further studies in their specialized field and to maintain a free exchange of ideas. The following officers were elected for the coming year: President, Bruce Curran; president-elect B. Holly Broadbent; and secretary-treasurer, Irwin F. Steuer.

PROVISIONAL PROGRAM FOR THE MEETING OF THE EUROPEAN
ORTHODONTIC SOCIETY AT BONN AND WIESBADEN,
JULY 3 TO 6, 1939

PRELIMINARY PROGRAM

SATURDAY, JULY 1

For those members arriving on Friday evening or Saturday morning.

- 10 A.M. Sail on the Rhine from Bonn to Königswinter. Ascent to Drachenfels ruins (mule, horse, car or funicular).
Lunch on the Drachenfels.
3-4 P.M. Return to Bonn.
6 P.M. Members meet in the Municipal Gardens (Königshof).
7-11 P.M. "Rhine in Flames" (only once a year). Rhine trip Bonn—Linz—Bonn on special steamer. Cold meal and refreshments on board.

SUNDAY, JULY 2

- 10-12:30 A.M. Tour of the town with a visit to Beethoven's house, the Provincial Museum (prehistoric skull of Neanderthal), and König Museum.
1 P.M. Lunch at hotels where and as desired.
2:30-7 P.M. Drive in private charabancs to the river Ahr and to the Nürburgring (longest motor-racing track in Europe).
Afternoon tea at the Nürburgring. Visit to the largest red-wine cellars in Europe at Mayschoss (Ahr) with wine samples.
8:30 P.M. Reception at Königshof Hotel. Cold meal.

PROGRAM OF MEETING

MONDAY, JULY 3

- 9 A.M. *Business meeting of the Society.*
9:30-10:30 A.M. *Opening of the Congress* and Addresses.
Farewell speech by the retiring president, Mr. Chapman, and address by the president of the Congress, Professor Korkhaus.
10:30-11:30 A.M. *Scientific Meeting.* Main Report I.
"Etiology of Distocclusion"
11:30-1 P.M. Papers.
For the ladies:
9:30 A.M. Drive in private charabancs to Lake Laach and Maria Laach Monastery.
1:30-2:30 P.M. Luncheon as guests of the Society (Lesegesellschaft).
3 P.M. *Scientific Meeting.* Main Report II.
"Diagnosis of Distocclusion"
4-6 P.M. Papers.
For the ladies:
4-6:30 P.M. Tea at Haus Ernich as guests of Mrs. Korkhaus.
7:30 P.M. Dinner in hotel, where and as desired.
8:30 P.M. "Rhenish Evening" in the Municipal Gardens as guests of the Lord Mayor of Bonn. Claret cup and cold meal.

TUESDAY, JULY 4

- 9 A.M. *Scientific Meeting.* Main Report III.
"Therapy of Distocclusion"
10 A.M.—1 P.M. Papers.
For the ladies:
Tuesday morning left free for the sights of the town.
1:30 P.M. Lunch as guests of the Society (Lesegesellschaft).
3-5 P.M. Visit to the Clinic and Polyclinic for Diseases of the Mouth, Teeth and Jaw, and special demonstrations of the methods employed in the Department for Maxillary Orthopedics. (Also for the ladies.)

- 5:30-11 P.M. Tour of the Seven Mountains (Siebengebirge) in private charabancs. Light supper at the Petersberg Hotel as guests of the German Society for Maxillary Orthopedics.

WEDNESDAY, JULY 5

- 8 A.M. Rhine Trip by steamer from Bonn to Wiesbaden. Luncheon and afternoon tea on board as guests of the Society. All luggage will be directly transferred from Bonn to Wiesbaden without any trouble to the members.
- 7 P.M. Arrival at hotels in Wiesbaden.
- 8:30 P.M. Banquet in the Kurhaus in Wiesbaden.

THURSDAY, JULY 6

- 9 A.M. Reception in the Congress building Paulinenschlösschen.
- 9:30 A.M.—1 P.M. *Scientific meeting.* Demonstrations.
For the ladies:
10 A.M.—12 M. Visit of the town and the pump rooms.
- 1:15-2:15 P.M. Lunch in the Paulinenschlösschen as guests of the Society.
- 2:30-3 P.M. Opening of the Scientific Exhibition for Maxillary Orthopedics and of the Industrial Exhibition.
- 3-5 P.M. *Scientific Meeting.* Demonstrations.
For the ladies:
4:30-6 P.M. Open-air tea and fashion parade on the terrace of the Kurhaus.
- 5-6 P.M. *Business Meeting of the Society.*
- 5-7:30 P.M. Samples of Rhine and Moselle wines in the wine bar of the Kurhaus.
- 8:30 P.M. Closing evening for members of the European Orthodontic Society and simultaneously reception for members of the German Society for Diseases of the Teeth, Mouth and Jaw.

SUBSEQUENT PROGRAM

From Friday, July 7, till Sunday, July 9, inclusive, the Annual Meeting of the German Society for Diseases of the Teeth, Mouth, and Jaw will be held, with Professor Korkhaus in the chair, the subject for discussion also being "Maxillary Orthopedics."

All those present at the Meeting of the European Orthodontic Society are cordially invited to attend this meeting also. The following are the main subjects to be discussed:

- "The Relationship of Maxillary Orthopedics to Paradentosis"
"Dental Surgery on Children and Maxillary Orthopedics"

In addition, a scientific and an industrial exhibition, both devoted to Maxillary Orthopedics, will be opened on Thursday morning. For Friday, Saturday, and Sunday the following scientific and social functions and excursions have been arranged:

FRIDAY, JULY 7

- 9 A.M.—1 P.M. Opening of the German meeting and papers.
- 3-6 P.M. Demonstrations and films.
- 2:30-6 P.M. Visit to the Opel works at Rüsselsheim, or excursion to the Taunus mountains to Eberbach Monastery.
- 8 P.M. Special Concert in the Kurhaus (as guests of the Town Wiesbaden): Beethoven and Brahms.

SATURDAY, JULY 8

- 8 A.M.—6 P.M. Papers in the morning. Demonstrations and films in the afternoon.
- 2:30 P.M. Excursion to Frankfurt am Main. Tour of the Taunus mountains. Visit to the Burgeff champagne cellars with samples.
- 8:30 P.M. Banquet of the Deutsche Gesellschaft für Zahn-Mund-u. Kieferheilkunde (German Society for Diseases of the Teeth, Mouth and Jaw), followed by illuminations, music and dancing.

SUNDAY, JULY 9

9 A.M.—1 P.M. Papers.

11 A.M. Concert in the flower gardens in front of the Kurhaus.

8 P.M. Special performance in the German Theatre.

Directly after the close of the meetings (i.e., from July 8 to July 10 or July 11 to July 13), a three days' drive through southern Germany in private charabancs, with guides speaking various languages, has been arranged. The following places will be visited: Heidelberg, Rothenburg, Dinkelsbühl, Nürnberg, by the Reichsautobahn to Munich, Lindau on the Lake of Constance, Constance, Black Forest, Baden-Baden. Those wishing to take part are requested to send in their names in good time.

Notes of Interest

Dr. Frank L. Camedy announces the opening of his office at 428-430 Medical Arts Building, Springfield, Mo. Practice limited to orthodontics.

Dr. E. O. Rosenast announces that he discontinued the general practice of dentistry on March 1, 1939. In the future he will devote his time to orthodontics at 1001 West Jersey Trust Building, Broadway and Cooper Street, Camden, N. J.

Dr. Matthew Connor Lasher announces the removal of his offices to the Beverly Medical Building, 415 North Camden Drive, Beverly Hills, Calif.

Dr. Richard H. Stucklen announces the removal of his office to 1003 Delaware Avenue, Wilmington, Del.